AMERICAN FORESTS and FOREST LIFE

FEBRUARY, 1925

TIMBER HARVEST : HOW BIRDS SAVE TREES
ANCIENT TREES OF ENGLAND

VOL. 31, No. 374 PRICE 35 CENTS

The American Forestry Association

Washington, D. C.

OFFICERS OF THE AMERICAN FORESTRY ASSOCIATION, 1925

President

GEORGE D. PRATT, Pratt Institute, Brooklyn, New York

Vice-Presidents

W. W. ATTERBURY—Pennsylvania
Vice-President, Pennsylvania Railroad

CHARLES S. BARRETT—Georgia
President, Farmers Union

DANIEL C. BEARD—New York
National Scout Commissioner, Boy Scouts of America

JOHN W. BLODGETT—Michigan
President, National Lumber Mfrs. Association

GEORGE CORNWALL—Oregon
Publisher, *The Timberman*

CHARLES DEERING—Illinois
Director, International Harvester Company

ANSON C. GOODYEAR—New York
President, Great Southern Lumber Company

GEORGE BIRD GRINNELL—New York
Author and Explorer

WILLIAM KENT—California

MRS. MAUD WOOD PARK—Washington, D. C.
Former President, National League of Women Voters

GIFFORD PINCHOT—Pennsylvania
Governor of Pennsylvania

FILIBERT ROTH—Michigan
Former Dean of Forestry, University of Michigan

HARVEY N. SHEPARD—Massachusetts
President, Massachusetts Forestry Association

B. H. SNELL—New York
Member of Congress from New York

HENRY VAN DYKE—New Jersey
Author

JOHN W. WEEKS—Massachusetts
Secretary of War

WILLIAM ALLEN WHITE—Kansas
Editor and Author

MRS. T. G. WINTER—Minnesota
Former President, General Federation of Women's Clubs

Treasurer

GEORGE O. VASS, Vice-President, Riggs National Bank, Washington, D. C.

Assistant Treasurer

IORWERTH JOHN ROBERTS

Executive Secretary

OVID M. BUTLER, The Lenox Building, 1523 L Street, Washington, D. C.

Forester

SHIRLEY W. ALLEN

Business Manager

C. V. MAUDLIN

Board of Directors

ROBERT P. BASS, 1924—New Hampshire
Ex-Governor of New Hampshire

F. W. BESLEY, 1925—Maryland
State Forester of Maryland

ERNEST B. DANE, 1924—Massachusetts

HENRY SOLON GRAVES, 1924—Connecticut
Dean of Yale Forest School

W. B. GREELEY, 1926—District of Columbia
United States Forester

GEORGE S. LONG, 1927—Washington
National Lumber Manufacturers Association

GEORGE HEWITT MYERS, 1924—Washington, D. C.

GEORGE F. PORTER, 1924—Illinois

JOSEPH HYDE PRATT, 1928—North Carolina
North Carolina Geological Survey

MRS. JOHN D. SHERMAN, 1928—Colorado
President, General Federation of Women's Clubs

HENRY W. SHOEMAKER, 1928—Pennsylvania
Member of State Forest Commission

GEORGE W. SISSON, JR., 1925—New York
American Paper and Pulp Association

E. A. STERLING, 1926—New York
Forest Engineer

JUSTIN R. SWIFT, 1926—Pennsylvania

WM. P. WHARTON, 1927—Massachusetts
Director, Massachusetts Forestry Association

WHAT THE ASSOCIATION IS WORKING FOR

ADEQUATE FOREST FIRE PROTECTION by federal, state, and other agencies, individually and in co-operation; the REFORESTATION OF DENUDED LANDS, chiefly valuable for timber production or the protection of stream-flow; more extensive PLANTING OF TREES by individuals, companies, municipalities, states and the federal government; the ELIMINATION OF WASTE in the manufacture and consumption of lumber and forest products; the advancement of SOUND REMEDIAL FOREST LEGISLATION.

The ESTABLISHMENT OF NATIONAL AND STATE FORESTS where local and national interests show them to be desirable; the CONSERVATIVE MANAGEMENT OF PUBLIC AND PRIVATE FORESTS so that they may best serve the permanent needs of our citizens; the development of COMMUNITY FORESTS.

FOREST RECREATION as a growing need in the social development of the nation; the PROTECTION OF FISH AND GAME and other forms of wild life, under sound game laws; the ESTABLISHMENT OF FEDERAL AND STATE GAME PRESERVES and public shooting grounds; STATE AND NATIONAL PARKS and monuments where needed, to protect and perpetuate forest areas and objects of outstanding value; the conservation of America's WILD FLORA and FAUNA.

The EDUCATION OF THE PUBLIC, especially school children, in respect to our forests and our forest needs; a more aggressive policy of RESEARCH AND EDUCATIONAL EXTENSION in the science of forest production, management, and utilization, by the nation, individual states, and agricultural colleges; reforms in present methods of FOREST TAXATION, to the end that timber may be fairly taxed and the growing of timber crops increased.

AMERICAN FORESTS
AND
FOREST LIFE

(Formerly American Forestry)

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

WASHINGTON, D. C.

OVID M. BUTLER, Editor — L. M. CROMELIN, Assistant Editor

Vol. 31 — FEBRUARY, 1925 — No. 374

CONTENTS

Published monthly—35 cents a copy—$4.00 a year

CHANGE OF ADDRESS

A request for change of address must reach us at least thirty days before the date of the issue with which it is to take effect. Be sure to give your old address as well as the new one.

Publication and Business Office, The Lenox Building, 1523 L Street, Washington, D. C.

Entered as second-class matter at the Post-office at Washington, D. C., under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 10, 1918.

Member A. B. C.

The Gorgeous Rosa Hugonis

(also called "The Golden Rose of China")

This spectacular and exquisite rose is almost indispensable to the rose lover. It is an early visitor, coming when other flowers are scarce, and makes gorgeous color for indoors, with its soft, delicate yellow. It grows rapidly, and becomes a burst of golden color, 6 feet high and 6 feet across, when matured.

Not every nurseryman can offer "Hugonis," for it is not easy to start the baby plants. We do it and grow the most vigorous stock—they are *guaranteed to bloom!*

Rosa Hugonis is fully described and pictured in our new "Star Guide to Good Roses"—a catalog that's more than a catalog. In it we not only tell the whole truth about a rose, but we do it entertainingly—in such wording as we've never seen in a catalog before!

The "Star Guide" is a short cut to rose success. 100 pages—18 in full color. It carries our exclusive new index, the first listing by experts of the 100 best roses for America.

Yes, you owe yourself the pleasure and fun of an evening with the "Guide"—a rare delight to the rose lover, a real inspiration to those who want to know roses better. The "Guide" is *free,* of course, and copies are now ready. Write today!

THE CONARD-PYLE CO.

★ *Formerly Conard & Jones Co.* ★

STAR ROSE GROWERS BOX A WEST GROVE, PA.

AMERICAN FORESTS

VOL. 31 FEBRUARY, 1925 No. 374

"Rough-and-Ready Engineers"

By Shirley W. Allen

"E-EE-OW!" The cry came from somewhere just above me, on the trail around Pegleg Mountain, and Buster gave one snort and lunge that nearly sent me rolling toward the steep rock-slide below. One more spirited snort, as we resumed our way cautiously up the trail, and I heard the blows of a hammer and a suppressed laugh. Looking up, I saw the ranger in the very top of a big Jeffrey pine. He was busy building a platform in the "crow's nest," which was to serve as a fire lookout for the summer. Reaching from a point about thirty feet from the base of the tree to the upper branches was a ladder made of telephone wire and steps hewn from pine limbs—frail looking, but securely anchored and strong enough to hold the weight of a heavy man.

"Come on up," called the ranger; and, following his advice, I shook his pitchy hand and found out in conversation that the whole lookout structure would cost about $25.00 plus three days' time for one man. I could see an area of forest covering more than five townships and totaling three billion feet of standing timber. We talked over the new mill which was expected to start within a few months, on private land just outside of the forest, and when we had finished our lunch at the foot of the tree I waved good-by and rode on to Clover Valley, a distance of twelve miles. I was to check over the fire tools there and help figure out a patrol route for the new forest guard.

As I neared Clover Valley Ranger Station I noticed with satisfaction that there was a substantial new gate on the pasture fence, and that the wire fence itself had stood up well under the weight of the heavy winter snows. The idea of placing stay pickets every two or three feet be-

THE RANGER'S FREIGHT TRAIN STOPS TO GET UP STEAM

Along the Sturtevant Trail, on the Angeles National Forest, California. "Rough-and-ready engineers" have learned to respect the pack-mule and to use this patient freighter to carry anything, from the side of a house to a keg of powder.

tween the permanent posts was working out well. They had saved a lot of ranger time usually charged to "repair of improvements."

Buster swung up to the gate, which I opened by means of a slide-bar, easily reached without dismounting. I let out a yell as I rode up to the neat log ranger station, and Buster gave one more lunge as a muffled reply came back. It sounded as if someone called from away underground. The mystery was soon explained. "Is that you, Pete?" came the muffled voice. "I'm walling up the well. Come on down." And, sure enough, there was the guard in the new well, up to his knees in water, and building the finest "dry wall" you can imagine.

I turned to Buster and said: "Up in a tree and down in a well. Can you beat that, old horse?" But Buster only "nickered" impatiently at the pack-mule, approaching from the pasture, as much as to say, "I'll be along down when the deputy takes my saddle off."

Lookouts and wells are only two of the scores of construction jobs which must be tackled every season by forest rangers on the 150,000,000 acres of National Forests in the United States. The locations where trails, telephone lines, cabins, water systems, drift fences, and bridges are needed are usually too far away to attract the services of small contractors. Money for improvements is scarce, too; and so, along with hundreds of other duties, the ranger becomes the "rough-and-ready engineer," using his native ability and knowledge of the laws of mechanics along with tricks which experience and study have taught him.

The economical use of moneys allotted for these purposes and the neat and efficient character of the improvements made are vastly to the credit of these men, who put to use a combination of brain and brawn which few other callings demand. Not only do they plan and supervise, but they do much of the actual construction work.

THE TRAIL WHICH REQUIRES NO MAINTENANCE MONEY

This hikers' highway was blasted out of a solid cliff between Mt. Lowe and Mt. Wilson, on the Angeles National Forest, California. It stands as a monument to the imagination and good sense of a "rough-and-ready engineer."

Suppose you were put in charge of a million acres of wild mountain land, at best traversed only by rude trails and roads, heavily timbered, dotted with old burns and high meadows, and perhaps gashed by deep canyons and cut in two by a high range of mountains. Suppose, further, that you were charged with the business of protecting from fire and trespass and of making available the various resources on this tract—resources including timber, forage, drinking water, game, recreation areas, and scenery. Remember all the time that the area, if square, would be forty miles on a side and that it is settled only by a few mining camps, summer resorts, cattle or sheep headquarters, and an occasional power plant. Then suppose you were to be allowed ten rangers for assignment year-long to as many districts of the tract, and an additional force of twenty or thirty short-term men for the fire season. While you were scratching your head over this, suppose you got a letter telling you to get all you could buy in services and supplies for $60,000 a year, to be spent on the job assigned you.

Having supposed all of this, what would you need in the way of improvements?

That question is a bit unfair. I should not presume to answer it correctly myself, but finding the answer is an outstanding task in the management of these million-acre tracts which we call National Forests.

Perhaps the first thing that must be done in equipping a National Forest is to designate and improve ranger stations, which may be from one to one hundred acres in extent. These stations usually must have house, barn, pasture, and water system. They must serve as home and office for the forest ranger and must supply shelter and often feed for his saddle and pack animals. Of course, the auto-

mobile has changed these needs to some extent as roads have become more numerous, but for many sections the improvements listed are typical.

While stations are being established, means of travel and communication cannot be neglected. Trails, roads, bridges, and ferries are urgent, so that a force of rangers may adequately cover territory assigned to them for patrol, fire-fighting, and dealing with forest users. Communication is the life of any business organization, and the force of a National Forest is no exception. Telephone lines must be built and maintained. In some regions fire-breaks are a good investment. New ranges for cattle, sheep, and horses may be made available by developing water supplies and improving old roads and trails, and many a "critter" has been saved from a broken leg or neck by the judicious widening of a dangerous driveway in rough country.

Nor can tool-caches—boxes under government padlock and equipped with axes, shovels, brush-hooks, water-bags, and lanterns for fire-fighting—be neglected. These are scattered over the forest at strategic points and must be kept full of something more than "old worn-out shovels I don't need on the ranch," as one luke-warm co-operator said.

All rangers are not carpenters, but, nevertheless, the National Forests of this country contained in 1923 not

RANGER LINEMEN IN THE FLATHEAD COUNTRY, MONTANA

Much of the success of any fire-protective system hinges on good communication. Tree lines give to the "rough-and-ready engineer" a chance to show what he knows about the telephone. This type of construction is a continual challenge to his skill and resourcefulness.

SPANNING DIABLO CANYON, ON THE SKAGIT RIVER

The rangers have 250 bridges to their credit. This one, on the Washington National Forest, furnished its share of thrills in the building.

less than 1,470 houses, 1,247 barns, 177 offices, and 3,665 other structures, including warehouses, camp buildings, garages, etc. Many of these were planned and built wholly by rangers; others were constructed by hired workmen guided by standardized plans and supervised by rangers. The total value of these buildings is $1,092,600.

Perhaps a ranger is not an engineer or a plumber—he would certainly not claim to be—but the 1,135 water systems on our National Forests have taken no little planning, surveying, pipe-fitting, blasting, and rock and concrete construction work. These systems include everything, from the well at Clover Valley to the tunnel at San Dimas, hydraulic ram at Humbug, the ditch at Mineral, and the tank at Skyland.

The "eyes of the forest," the men (and women) who live through the fire season on top of the lonely peaks in glassed-in lookout houses, occupy 227 such structures, valued at $114,000. Many of these were built by rangers and guards from material packed on mules to the mountain tops. On mules did I say? There is, or was, one lookout house on Mt. Lassen, in California, where the material was packed for the last rocky thousand yards on the backs of men. It was a harsh voice that came over the phone to me one day, announcing: "Say, if you want us to keep on making jackasses of ourselves up

here, I gotta have another pair of boots. Send me that pair under my bunk." Unfortunately, for a good example of construction work, this particular building is not included in the 227 mentioned. It was shamefully demolished early in the second season by the temperamental and volcanic peak upon which we chose to set it.

To get above the surrounding timber, steel and wooden towers must sometimes be built, and there are 277 of these, worth $53,000, to say nothing of the makeshift tree-top affairs like the one on Pegleg Mountain.

Rangers' homes and the pastures for their pack and saddle animals are enclosed by 2,599 miles of fence, valued at $460,000 and built to stand the ravages of winter snows, "breachy" stock, and occasional lack of money for repair. Range fences, built to define pasture allotted to stock grazed on the National Forests under permit and to prevent stock from "drifting," extend for 2,100 miles. Many of these fences have been built by rangers in co-operation with stockmen, who more and more show a fine spirit of teamwork in utilizing the forage resource. The value of these range fences is $328,000.

Range water systems have been developed principally by fencing off springs, so that they do not become mudholes from tramping of stock, and piping the water to wooden or concrete troughs. Various types of range water development, largely figured out and constructed by rangers and stockmen, total 1,316 and represent an actual value of $93,000.

But it is in the construction of trails and telephone lines that the ranger—rough, ready, intelligent, and tireless—shows the greatest skill and ingenuity. People who are soured on "government inefficiency" would find it most refreshing to watch the keen interest of the average forest ranger in making funds allotted put his pet trail farther and farther into the wilds. First, he must prove to those who allot funds that the points he would connect *should* be connected. He "looks it out"; studies how he can get the greatest distance with least grade, fewest stream fords, bridges, and switchbacks. When he gets through, he wants to be sure of low maintenance cost and the value of the trail for purposes such as patrol, connection with other trails, and opening up of new resources, such as range, scenic camping spots, or sources of fire-fighting help.

Many of the rangers have become expert, not only in laying out trails, which involves skillful use of hand levels, but in the handling of the explosives so necessary in the rocky canyon and mountain country where they work. They have also developed near-experts out of laborers whom they recruit and use year after year.

A few years ago one of these rangers, with a head that worked overtime, became disturbed because every spring brought a week's work repairing a section of trail used by thousands of hikers, between Mt. Lowe and Mt. Wilson, on the Angeles National Forest, in California. This trail dipped down into the head of Eaton Canyon a hundred feet or more, traversed a loose rock-slide, and climbed out again. This route was taken originally because it offered the line of the least resistance, physically and financially; but every spring it practically had to be rebuilt. There was one other place to put the trail, avoid the dip, and bid maintenance cost good-by. This was straight along an almost perpendicular mountain side for a distance of about 400 yards. There was powder (TNT) left over from the war, already paid for and available; there was also some money, and there were two resort owners who were sufficiently interested to contribute a small amount of money, some labor, and the services of a pack-train. Armed with these facts, the ranger proved his point, and today the trail stands as a monument to imagination and good sense. Maintenance cost has been practically eliminated, and in a few years the trail will pay for itself. Dozens of other similar examples could be cited among the 10,606 miles of trail built up to 1923 and the 29,000-odd miles of old trail maintained. All of the travel routes cannot be roads, nor should they be, if it were possible. Some of the wild retreats must be kept free from the odor of gasoline and be made accessible to the hiker and horseman only. Good trails will always be needed and the rangers' contribution to the science of their construction is tremendous.

Bridge-building has probably brought the forest ranger more thrills than any other of his "rough-and-ready" engineering efforts. Few of these have been large structures, for those built in connection with road projects are usually in the hands of contractors working under the direction of professional engineers. But the ranger has something like 250 bridges to his credit, and the use of rope, tackle, ax, and cable has taught him how to keep his feet dry.

What forest rangers have learned about telephone lines may be judged by the fact that the National Forests are largely directed, during fire season, over 29,139 miles of efficient telephone lines built and maintained by rangers and guards. Many are tree lines and require frequent maintenance trips, while those connecting the lookout stations often have to be rebuilt after winters of heavy snow in the high altitudes. The total investment in telephone systems on our National Forests amounts to almost $2,000,000.

Aside from roads and trails, valued at $32,424,032, the permanent improvements on the National Forests of the country are valued at $4,868,594. Much of this is represented in the salaries paid our ranger force. These men have used their heads and hands not only "up in a tree and down in a well," but in a hundred other telling places where native skill, ingenuity, and adaptability are at a premium.

The term "rough and ready" does not mean that National Forest improvements have not come to the place where definite standards are demanded, nor where improvement over early construction work has not been made. Men of the highest engineering ability are continually studying the problem of National Forest improvements along with heavy duties of design and supervision of the larger works.

Timber Harvest and Scenic Beauty

By Arthur Hawthorne Carhart

A WIDESPREAD belief exists that, to perpetuate native scenic beauty, no ax must touch the trunk of any tree in the landscape. Superconservationists preach this doctrine; others believe it with slight reservations. Even foresters here and there are prone to accept it, because so actively propounded by certain outdoor enthusiasts.

Just how this belief took root is not readily evident. Perhaps it came from a wholesale revulsion at the slashing, wasteful methods of the early harvesters of our virgin forests; or intolerant nature-protectionists may not differentiate between forest stands and planted parks, where every tree has a studied place in the landscape. In urban parks trees are precious things and the loss of one detracts from the scene.

HERE THE TREES ON THE POINT OF LAND SHOULD BE PRESERVED, BUT REGULATED CUTTING ON THE SLOPES WOULD BENEFIT THE GENERAL SCENIC EFFECT

Those people who rush to the protection of trees upon the slightest provocation, believing that he who cuts a tree commits a crime are sentimentalists. They are not practical conservationists. They would establish scenic reserves at certain spots because of the extensive stands of timber which exists there. But do they appreciate that forest trees die? Some die when they are little seedlings, whipped in their struggle for life before they get started. Others are choked out in the fierce struggle that every tree must face if surrounded by its brothers. It falls, a forlorn, twigless pole, to rot in the thicket and give strength to its more successful competitors.

Some trees prevail. They grow stout trunks, carry feathery heads green with leaves or needles, and send their roots down to suck up needed moisture for their life sap. These trees form our forests. They live through robust youth, reach middle age, and, like men, become mature. Then they loose their grip on life. Finally they fall, to become a part of the forest floor.

Trees are growing, living, maturing, dying things. They are not immutable elements of the landscape, as granite canyons, lakes, or peaks. This fact seems to have been lost sight of by the people who would take the forest, which is lovely in its mature stateliness, and preserve it just as it is, for all time. It would be quite acceptable if we *could* stop the laws of nature from moving forward in some particularly fine bits of woodland and hold them just as they are, for the use of the public through many generations. But there is no fountain of youth for the tree. We cannot set aside for all time something which is not stable, something which is changing as the seasons change. It would be as sensible to suggest making a park preserve out of a particularly brilliant stand of oaks because of their fall coloring as to propose such a reservation of a growing forest. Both are passing conditions. One is more transitory than the other, but the principle is the same. National or state scenic preserves should not be founded on forests alone, in spite of the fact that forests are necessary features of such areas.

There is one tree which is an exception to these state-

ments. The Sequoia has a life cycle of such length that it possesses a stability comparable almost to the granite walls of a great canyon. We have recognized this fact and created national parks to protect these ancient, persistent natives from ruthless destruction. Their life cycle reaches into the thousands of years. Compared with their longevity, the life of a great western yellow pine is but a fleeting season.

THIS KIND OF "TIMBER HARVEST" UTTERLY DEVASTATES SCENIC BEAUTY

Not long ago a proposal was made to add the Kaibab Plateau to the Grand Canyon National Park. There are no majestic mountains there. There are no canyons that are not surpassed by many others. There are no lakes of superior, alluring beauty. But there is a great, expansive forest of western yellow pine. By far the major portion of that pine is mature.

The forests of pine on the Kaibab are magnificent. They are inspiring. Their very extent makes them impressive. They represent a phase of distinctive landscape. No one will dispute these facts. But these fine old trees have run their race. They are as old men who are limping toward a tryst with Death. Their days are numbered. Their life cycle is nearing completion.

Recently a report came from the Kaibab that the bark beetles are raiding the forests in a most serious manner. The mature and overmature trees are easy prey for these little tree-killers. Young trees drown the borers in pitch. The older trees have not the flow of sap to do this, and the beetles whip the old-timers in a season.

There is a way to perpetuate the Kaibab forests in robust, healthy stands of western yellow pine; but it is not by locking up the forest and permitting these old veterans to fall and rot. By selective cutting, under proper forestry methods, the mature trees can be removed from these stands, so that the young trees may come in. They

A GOOD EXAMPLE OF TIMBER HARVEST. BY SELECTIVE CUTTING UNDER PROPER FORESTRY METHODS, THE MATURE TREES ARE REMOVED AND THE BRUSH CAREFULLY PILED AND DISPOSED OF. SUCH TREATMENT HELPS, RATHER THAN HURTS, THE LANDSCAPE EFFECT OF THE FOREST

will reach up eager branches to fill the places now monopolized by the older trees, in which growth has all but ceased. A rotation of cutting, permitting some of the less mature trees to stand, will not ruin the landscape effect of the forest.

This proposal to cut trees, not because of the lumber to be derived from such timber harvest, but to perpetuate green forests as one of the greatest elements of broader scenic landscapes, is so revolutionary to some that a confession is justified. For four years I served the United States Forest Service as recreation engineer. It was my duty to protect the scenic values and make them available for human use. My viewpoint was and still is that of a specialist in designing means of proper use for such beauty as we find in our national and state parks and forests. When entering this work I held the idea that there should be some prohibition of cutting in the forests to protect scenic and recreation values. My whole background of study and training had molded me to this viewpoint—leave nature alone.

In the private practice of landscape architecture, the growing tree in a scene is very valuable. Time, money, and patience are required to establish it. In the designed and planted landscape, every tree has a definite place to fill in the outlook. In extensive forests it is different. The gods of nature are bountiful. The individual tree is no longer important. It is the *effect* of a forest which is the great value in a broad landscape.

Four years in the field changed my ideas about cutting in the broader landscapes, where forests are the principal unit of the scene. I am now converted to the idea that properly regulated cutting in forest stands is not only sound from an economic viewpoint, but in broader landscapes, where forests predominate or are a major element, the proper harvest of trees does not permanently or at any time greatly impair the scenic beauty. Instead, well-directed cutting insures a permanent forest of strong, dark green, robust trees. This is the important factor in the greater landscapes, where whole watersheds are in view at once.

No such policy could be followed in a man-made park. There each tree is important. But in the forest landscape view, individual trees are blended into a mass effect. The individual tree is lost. The forest is gained. The perpetuation of the mass effect under such circumstances is more important than the preservation of individual trees, and the perpetuation of the mass effect in a forest is best insured by following good forestry practices, one of which is the harvest of mature trees.

There are points in our forest parks, on lake shores, at spots where small groups of large trees are focal points in a view, around residence areas, and at other places where the landscape effect depends on individual trees or small groups. There cutting must be prohibited or allowed only after the situation is thoroughly studied. But these points are far different from the acres and acres of

[*Continued on page 102*]

Photograph by George L. Beam

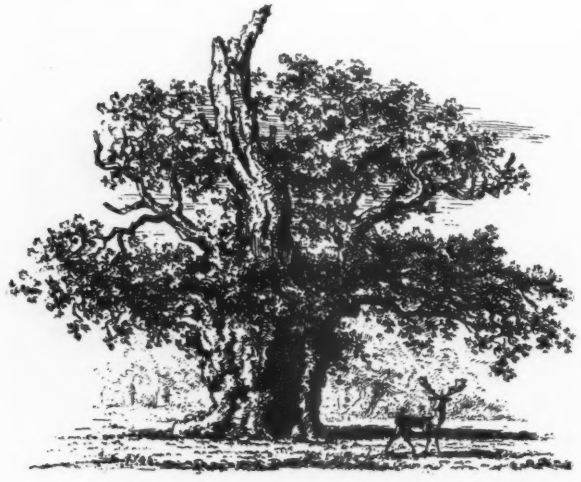
NO ONE WOULD ADVOCATE THE REMOVAL OF THESE PICTURESQUE INDIVIDUAL TREES. THEY ARE TOO IMPORTANT AN ADJUNCT TO THIS EXQUISITE SCENE IN THE SAN ISABEL FOREST

Famous Trees of England

By Eric E. Leibner

IN CALLING to mind some of the famous trees of England, it must be said at the outset that there are many more trees with histories, or that are in some other way remarkable, than could be mentioned here; for a tree may be a very ancient survival indeed, a venerable relic that was perhaps not so very young when William the Conqueror first came to England.

Many oaks in England are of great antiquity, but there are also yews which are far older. The huge yew-tree in Crowhurst Churchyard, near Lingfield, is thought to be 1,200 years old. It still thrives, although about a hundred years ago a room was cut in its mighty trunk by some barbarians. The girth of the trunk is 32 feet 9 inches. A table and chair were placed in the room, which will hold 18 or 20 persons, though with no room to spare. The door of this singular apartment is now generally kept closed and padlocked.



From "Sylva Britannica," courtesy, Longmans, Green & Company

THE QUEEN'S OAK

This old tree breathes of romance in England's history, for the story goes that here, in 1464, Edward IV met the beautiful Elizabeth, whom he later made his queen.

Among venerable English oaks the "Queen's Oak," in the old forest of Whittlebury, near Pottersbury, is still hale and hearty but is indeed historic, for under its shade, in 1464, Edward IV met Elizabeth Woodville, the beautiful young widow of Sir John Grey of Groby, whom later he married. The story had a tragic ending; for, years later, her two sons, after the death of the King, were murdered in the Tower of London by their uncle, in order that he, as Richard III, should secure the succession to the throne.

"Tradition has it that the Queen shot a buck with her own hand under this oak, which was her favorite tree. It is still in some degree of vigor, though most of its boughs are broken off, and those which remain are approaching to a total decay, as well as its vast trunk; the principal arm, *now bald with dry antiquity,* shoots up to a great height above the leafage, and, being hollow and truncated at top, with several cracks resembling loopholes, through which the light shines into its cavity, it gives us an idea of the winding staircase in a lofty Gothic turret, which, detached from the other ruins of some venerable pile, hangs tottering to its fall, and affects the mind of a beholder after the same manner, by its greatness and sublimity" ("Sylva Britannica," London, 1830).

The ancient oaks of Windsor Forest, now Windsor Great Park, are long past their prime. "William the Conqueror's Oak" is decaying and "Shakespeare's Oak" long ago became a mere stump, while the most famous of all, "Herne's Oak," was blown down in 1863. In the same year Queen Victoria planted an oak sapling on the site of it.

Herne, by tradition, was a keeper who went mad and roamed the forest with deer's antlers fixed to his head. At length he hanged himself on the oak, and his ghost, it was said, haunted the spot. The story of this unfortunate man was made use of by Harrison Ainsworth in his "Windsor Castle."

The Major Oak, in Sherwood Forest, is hollow, and although only one person at a time can well squeeze through the rift in its trunk, there is room for 20 people

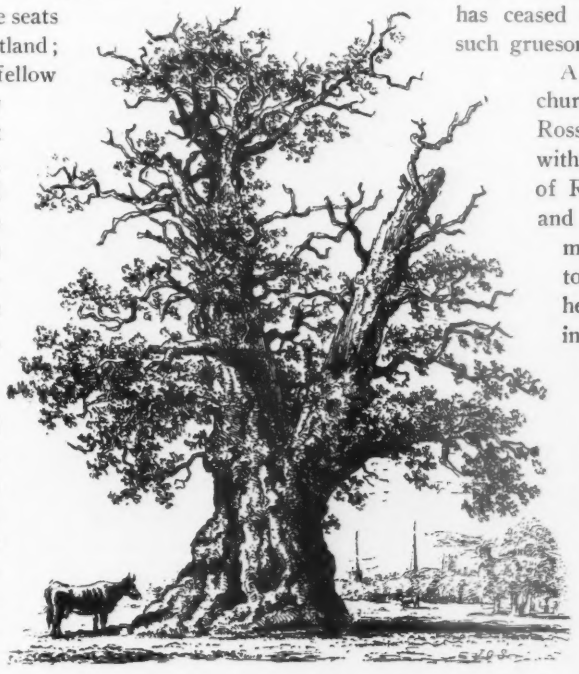
From "Sylva Britannica"

THE GREENDALE OAK

Little is left to hint at the former glory of this old monarch, which stands in the park of Welbeck Abbey.

within. Around its root the girth of the Major Oak is 54 feet. This tree still flourishes.

Not far distant is the Greendale Oak, in the park of Welbeck Abbey. Quoting from "Sylva Britannica" (London, 1830): "There is, perhaps, no spot in England where once were to be found so many ancient and magnificent oaks as in the Park of Welbeck, in Nottinghamshire, one of the seats of his Grace the Duke of Portland; insomuch that Mr. Rooke, a fellow of the Antiquarian Society and a great lover of forest subjects, thought them worthy, forty years ago, of a detailed account, wherein he gave the characteristics of many which have now laid their leafy honors low. But the Greendale Oak, however, still remains, little altered in its general aspect by the lapse of half a century, since it was described as a ruin. In the year 1724 a roadway was cut through its venerable trunk, higher than the entrance to Westminster Abbey and sufficiently capacious to permit a carriage and four horses to pass through it. A print of it was published at that time, in which it scarcely varies from its present appearance, excepting that the artist sought to heighten the effect by choosing the moment when one of the old-fashioned equipages of the day, with its four long-tailed appendages, was passing through the cavity. In 1790 Mr. Rooke gave the measurement of it as follows: The circumference of the trunk above the arch is thirty-five feet three inches; height of the arch, ten feet three inches; width about the middle, six feet three inches; height to the top branch, fifty-four feet. Evelyn, and after him Hunter, makes some slight variation in these measurements. Evelyn calculates that two hundred and twenty-five head of cattle might stand within the shadow of its branches; but at the present day the herd must be, indeed, diminished if their owner should mean them to escape the heat of the meridian sun from the shelter of its few remaining branches and thinly scattered foliage." The old tree is now greatly shrunken, but little remaining to even hint at its former glory.



THE SHELTON OAK *From "Sylva Britannica"*

Tradition has this tree a massive giant in 1403, when it served as a lookout for Henry IV in his battle with the English insurgents.

The oldest wood in England is the weird "Wistman's Wood," on Dartmoor, in a lonely and little visited nook. It is a wood of miniature dwarf oaks, growing amid boulders. The wood is full of adders and the grim trees are thickly draped with shaggy, gray-green moss.

There stands in a field near "Capp's Lodge," not far from Burford, Oxfordshire, an oak with this inscription on its trunk: "H. D.: T. D., 1784." It is this tree on which the bodies of Henry and Thomas Dundson were gibbeted, after being hanged at Gloucester for highway robbery. They were leaders of the "Dundson Gang," which once terrorized that countryside. It is not a large tree. Local superstition declares that it has ceased to grow since being put to such gruesome use.

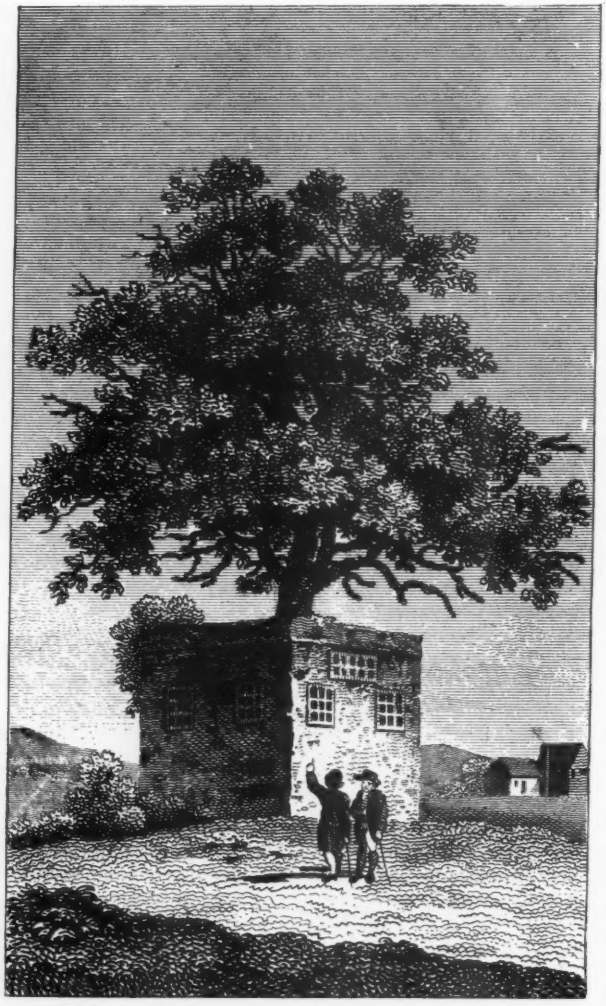
A very curious tree grows in the church of Ross, in Herefordshire. Ross is the little town associated with John Kyrle, called "The Man of Ross," who was born in 1637 and died in 1724. He was in many ways a benefactor to the town, and, among other things, he planted the fine elm avenue in the churchyard, which still remains in part.

For many years past two suckers from the elms outside have sprung up through the flooring of Kyrle's pew in the little church, and, although every now and then they appear to be dead, they renew their vigor and at present are flourishing exceedingly. Needless to say, they are looked upon as miraculous in Ross and are jealously cared for.

Shelton Oak, a little way to the north of Shrewsbury and standing by an old toll-house on the main Hollyhead road, is called "Glendower's Oak" because from its branches Owain Glyndwr is supposed to have watched the progress of the battle of Shrewsbury. As a matter of historical fact, he was many miles distant on that day of July 21, 1403, when the battle was fought; and had he even been there, the fight took place three miles away, and in such a situation that he could by no possibility have watched it from the oak. But the tradition persists, borne out by the following from "Sylva Britannica" (London, 1830): ". . . Just before the battle of Shrewsbury, June 21, 1403, headed on one side by Henry the IVth in person, and on the other by the gallant Henry Percy, surnamed Hotspur, Owen Glendower, the powerful Welch chieftain and the firm adherent of the English insurgents, ascended this tree and from its lofty branches, then most probably in the full pride of their vigour, reconnoitered the state of the field; when, finding that the King was in great force, and that the Earl of Northumberland had not joined his son Henry, he descended from his leafy observatory with the prudent resolution of declining the combat, and retreated with his followers to Oswestry." . . .

The great age of the Shelton Oak, thus pointed out by the tradition which connects it with the name of Glendower, is likewise attested by legal documents belonging to Richard Hill Waring, Esq., whose ancestors possessed lands in Shelton and the neighbourhood in the reign of Henry III. Among this gentleman's title deeds is a paper subscribed "per me, Adam Waring," and entitled "How the grette oake at Shelton standeth on my grounde."

Everyone has heard of the "Royal Oak" at Boscobel,



THE ROYAL OAK

Another tree with claims to royal glory, for Charles II hid in its shelter when a fugitive after the Battle of Worcester, in 1651. This illustration was reproduced directly from Joseph Taylor's "Remarkable Trees," published in London in 1812 by W. Darton.

the tree in whose branches Charles II was hidden when a fugitive after the disastrous Battle of Worcester, in 1651. The original tree was cut to pieces for souvenirs, not long after the Restoration, and the oak that stands on its site is a fairly young one; but it is still called the "Royal Oak," perhaps partly because it was grown from an acorn of the parent tree. It is after this old tree that so many inns in various parts of England are called the "Royal Oak" inn.

The following description of the Royal Oak is given by Joseph Taylor in his book "Remarkable Trees," published in London in 1812:

"This celebrated fair-spreading tree stands near the middle of a large house at Boscobel, in the parish of Donnington, in Staffordshire, the boughs whereof were once covered with ivy, in the thick of which King Charles the Second sat in the daytime, with Colonel Careless, and in the night lodged in Boscobel house. Doctor Stukely gives us the following information concerning this remarkable tree and Boscobel house. The doctor lodged at an inn called Ivesey Bank, on the borders of Staffordshire and Shropshire. About a mile off, in a large wood, stands Boscobel house, where the Pendrils lived, who preserved King Charles the Second after the Battle of Worcester, and made famous by the royal oak. The granddaughter of William Pendril still lives in that house (in 1764). The floor of the garret (which is a Popish chapel) being matted prevents any suspicion of a little cavity, with a trapdoor, over the staircase, where the King was hidden. His bed was artfully placed behind some wainscot that shut up very close. At a bowshot from the house, just by a horsetrack passing through the wood, stood the oak, into which the King and his companion, Colonel Careless, climbed by means of a hen-roost ladder when they judged it no longer safe to stay in the house, the family reaching them victuals with a nut-hook during there continuance in that situation.

"It happened that whilst the King and the Colonel were in the tree a party of the enemy's horse, sent to search the house, came whistling and talking along the road. When they were just under the oak an owl flew out of a neighboring tree and hovered along the ground, as if her wings were broken, and the soldiers merrily pursued it without making any circumspection. The tree is now inclosed within a brick wall, the inside whereof is covered with laurel. The oak is almost cut away in the middle by travelers, whose curiosity leads them to see it. Close by the side grows a young, thriving plant from one of its acorns. The King, after the Restoration, reviewing that place, carried some of the acorns and set them in St. James Park, or garden, and used to water them himself. He also gave Pendril an estate of about two hundred pounds a year, which still remains in the family. . . ."

The present tree is fine and thrifty and, as we have before observed, is said to have originated from an acorn of the old oak; and the wall, which was ruinous, is rebuilt of brick and has an inscription in Latin engraven on a brass plate.

A FEW BLUE AND SNOW GEESE FLYING HIGH ABOVE ECHO VALLEY

How Birds Saved My Trees

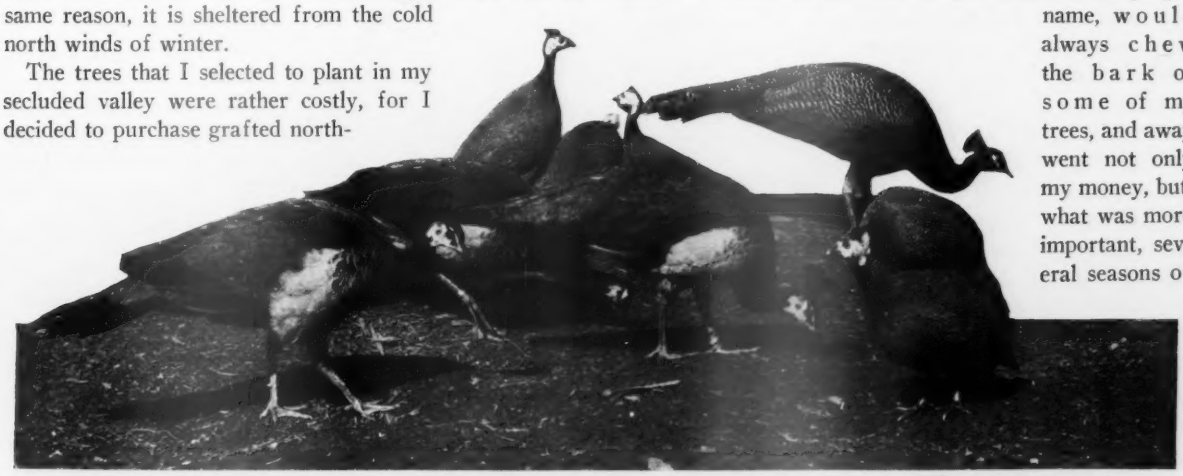
By George Hebden Corsan

FROM childhood I was always interested in growing things. My grandfather's garden—to be sure, he lived in the city, but he had an entire block to himself—was always a wonder place, a delight, a haven for me, for I had seen the ground when it was absolutely bare, when not even weeds would grow on it. As I have grown older, my hobby has been to grow trees—trees that no one else grew, trees that even the government experts declared could not be grown in my particular section of the country—just west of Toronto, therefore north of Lake Ontario.

It so happened, quite a number of years ago, that I was exceedingly fortunate in the purchase of a bit of valley three miles from the lake—twelve acres from hilltop to hilltop, and a winding creek thrown in for good measure. It certainly is a full measure in springtime. My valley runs east and west, and is thus exposed to the heat of the summer sun for its entire length, while, for the same reason, it is sheltered from the cold north winds of winter.

The trees that I selected to plant in my secluded valley were rather costly, for I decided to purchase grafted northern varieties of hickories, pecans, English walnuts, Constantinople tree hazels, large sweet chestnuts, Japanese and Chinese walnuts, heartnuts and chestnuts, European filberts, and black walnuts, all of which I secured either from the Plant Introduction Bureau at Washington or from Mr. J. F. Jones, the nut tree specialist, at Lancaster, Pennsylvania.

Very naturally I did not like to pay from $3 to $15 for a tree and find some early spring day that it had ceased to live after starting a good growth and surviving our worst winters. However, whether I liked it or not, I had such discoveries forced on me year after year. You see, one winter we would have no snow. The next winter we would have very little. My trees would be in fine condition. Then for two or three winters we would have terribly deep snow, that reached far above the protective tar paper or wire netting. In such bad winters the field mice, or, rather field voles, to give them their proper name, would always chew the bark of some of my trees, and away went not only my money, but, what was more important, several seasons of



Photograph by Boyd

YOUNG PEAFOWL AT ECHO VALLEY

Peafowl raised on your own place will always stay with you. This picture was taken on a windy day, so we drew them up to shelter by throwing a handful of corn on the ground. The pearl guineafowl are very suspicious of the camera, and the peafowl are much tamer than these suspicious guineas. The birds are protected from winds and storms only by open sheds, and they have wintered at Echo Valley without artificial heat when it was 22° F. below zero.

FOSTER PARENTS

Canada geese hatched out these young blue geese because their own eggs were taken away and the blue goose eggs substituted. They made splendid foster parents. The babies swim between the father and mother, as is typical with Canadas.

care and cultivation. I always looked after each of my trees as I would a baby, and they always responded accordingly, for trees love kind attention.

The soil in my valley is exceedingly rich and the grass grew very thick. Mice abounded in such good cover. So did cats! Certain Torontonians would bring their cats out to our neighborhood and turn them loose. But the cats were like human beings. If you or I went into a restaurant and the waiter asked: "Which will you have, sir, a luscious field mouse or a delicious quail?" it would not take us long to decide on the quail. Naturally, it did not take the cats long, either. They went after the song birds that made their home in my valley and left the mice to their own pursuits.

One day when I was spinning through the country on my motorcycle I stopped to watch some geese. I leaned against the fence, watching them idly as they grazed in the field. I noticed how closely they cropped the grass. This was just what I wanted. Geese would keep the grass so short the mice would have no place to harbor and build nests and raise more mice.

You may want to know why I did not plow my land and keep it free of grass. That is very easily answered. My place is a very pretty, but exceedingly rough, valley—really the most beautiful valley in or around Toronto—and if I had plowed the bottom land the spring floods would very soon have carried all the soil down to Lake Ontario. Then I would have had only stones left; I would have had no soil at all and no trees. Then, too, the land is so rough that it is only adapted for growing trees or for pasture. I did not want cows. I was not interested in raising calves. Besides, cows would destroy the woods flowers I had planted on my southern hillside, under the big trees.

I straightway secured some African, Chinese, Toulouse, and Embden geese. They ate the grass; they bred and multiplied and ate more grass. But I discovered that they, too, like the cats, had their defects. They barked my small, newly planted trees unless I put a very high, fine-meshed wire or iron guard around the trees until they attained growth sufficient to harden the bark to withstand their attack and dissuade them from trying their sometime favorite delicacy.

I considered further. I would get rid of my domestic geese and try the wild geese. I knew such geese had a more tender bill and a more discriminating taste. They would not bark my trees when they were supposed to eat grass. I secured some of the wild Canada geese, the big honkers that give tongue so musically as they fly northward to their breeding grounds or as they come south to

A PARAGON CHESTNUT TREE AT ECHO VALLEY

Selected trees were chosen to plant in the valley, and this one is three years old from the graft. The rich soil was responsible for the thick, rank grass before the geese came to keep it cropped short. The half-grown burs have been thinned.

their winter feeding. My Canadas bred and multiplied and flew up and down the valley and stayed with me and ate the grass.

Then one day some one said to me:

"No one has ever been able to breed the Snow goose in domesticity."

"That's interesting," I responded; "I will try my hand at it."

I obtained some Lesser Snow geese—one here, two there—and after a long time I got them to breed, and they flew around and around my valley in a circle, but not up and down the length of the whole valley, like the big Canada honkers. They, too, aided in keeping the grass short.

Photograph by Boyd

WILD GEESE WILL FLOCK TOGETHER TO A CERTAIN EXTENT IN THE EARLY WINTER, BUT EVEN DURING FEEDING TIME YOU WILL NOTICE THEY KEEP IN GROUPS

Presently some one else said there wasn't a Blue goose's egg nor a fledgling Blue goose specimen in any museum in the world; that even the McMillan Arctic Expedition had failed to locate the breeding grounds of the Blue goose. In fact, they had not discovered even one nest. I learned later that the Carnegie Museum at Pittsburgh had sent out an expedition which found the breeding grounds of the Blue goose and brought back specimens of both eggs and young.

I was more than interested and managed to get a few Blue geese, as I had the Snows. I tried breeding them for quite a long time, and you will see quite a few Blues and Snows in the illustrations, flying around like the wind. They fly around and around the valley, not up and down the valley like the Canadas, who like to take longer trips; they fly higher than the high-flyer pigeons and are quite out of sight. As they come back toward the earth, you can hear their wild, joyful cries almost before you can see them. The Snows and Blues fly together; the Canadas and the Bernicles fly together, while the White Fronts prefer their own company. However, they are all united in one matter—they keep the grass quite short. It is not at all necessary, by the way, to have a pond, creek, or lake for geese as one must have for ducks and swans.

Geese, however, are strict vegetarians. They eat grass and grains, but they won't eat meat of any kind whatever, unless it be certain insects and mollusks on rare occasion. The mice had mostly disappeared, not having any cover, and I did not lose any more trees through them.

But recently a new calamity appeared. Returning from my summer's work, I found the leaves were almost stripped from my valuable black-walnut trees by the black, hairy, Handmaid moth caterpillar, and from the chestnut trees by the "woolly bear" caterpillar. This was a terrible state of affairs; but I noticed the trees in the large inclosure, where my gamekeeper had shut the peafowl, were in good condition; not a leaf was destroyed.

More consideration. It was evident the good leaves

[*Continued on page* 110]

The Kaibab Deer Drive

"An Interesting Failure"

ON DECEMBER 14, 1924, George McCormick, who had entered into a contract with the State of Arizona to reduce the starving herd of deer on the Grand Canyon Game Refuge, in the Kaibab country, by driving from 2,500 to 6,000 head across the Grand Canyon, started his drive. On the 16th of December, after three days of effort, the attempt was abandoned. Newspapers, moving-picture men, writers, state and federal officials, are almost unanimous in the opinion that the enterprise was poorly organized and financed, and that while the objects sought were commendable, it undertook the impossible.

Mr. George McCormick, his brother, Charles McCormick; twenty-five white men, mounted, and seventy-two Navajo Indians, afoot, composed the force which undertook the drive. The Forest Service, which has charge of the Grand Canyon Game Refuge, was represented by District Forester R. H. Rutledge, of Ogden; Forest Examiner S. B. Locke, and Forest Supervisor H. G. McPheters, who are reported to have offered every courtesy to Mr. McCormick. The Park Service was represented by Frank J. Winers, A. Burnell McAllister; the State of Arizona, by State Game Warden G. M. Willard and four deputies, while the Biological Survey was represented by M. E. Musgrave, a leader in Predatory Animal Control, from whose report is taken much of the information here recorded.

On the 13th Mr. Musgrave, Forest Examiner Locke, and Supervisor McPheters conferred with Mr. McCormick about the proposed route. They found that he planned to drive the deer over seven miles of trail where they would have to go single file, with perpendicular cliffs above and below, and, at Mr. McCormick's request, made a reconnaissance over an alternate route which proved to be impracticable. On the 14th the drive started, although only twelve of the seventy-two Indians had arrived. The mounted men were made up largely of inexperienced boys from Flagstaff and other towns and apparently failed to get a clear idea of the planned movement of the deer. On the night of the 15th it was found that all the advantage gained previously had been lost, the deer breaking through the line of horsemen and Indians.

The drive encountered a severe snowstorm on the 16th and the deer, which were ahead of the line of drivers, stampeded and scattered in all directions. Zane Grey and a number of moving-picture camera men, who had come in to get the story, were packing up to leave; the Indians were discouraged, and Mr. McCormick felt that it was useless to continue the attempt. Owing to the cloudy weather and to the impossibility of predicting the exact course of the drive, no pictures were secured. Mr. Musgrave makes the observation, after watching the behavior of the deer for three days while the attempt was being made to move them, that it might be possible, with a thousand men properly equipped, to drift the deer from one portion of the range to another. The feat of forcing them into the Grand Canyon and across the Colorado River seems utterly impossible.

The Indians engaged for this work showed great interest. They were armed with sheep bells, which they jangled continuously in order to frighten the deer forward. They were quick, however, to observe the wild deer did not take well to this method of being herded. Mr. Musgrave tells of one old Navajo Indian, known as Grey Hat Charlie, in the following language: "I asked him if he saw many deer. He said, 'Lots of deer; maybe so hundred deer.' I asked if the Indians drove the deer. He said, 'Yes; drive deer, drive lots of deer.'" "Where did you drive the deer," I asked. He then swung his hand around, accompanying the motion with a whistling sound, to indicate that the deer were driven in all directions.

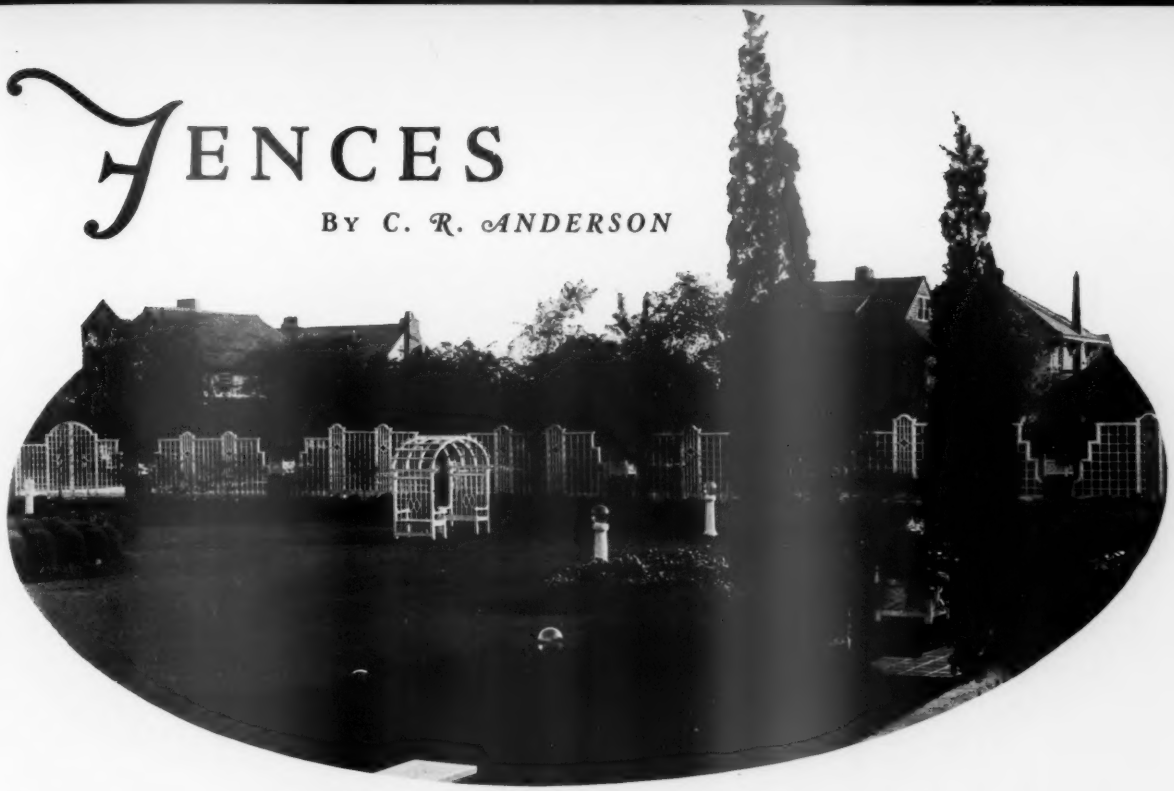
Local papers report several of the Indians mumbling, "Huh, white man heap d—n fool."

District Forester Rutledge speaks of the drive of the Kaibab deer as an "interesting failure," so complete that the attempt will probably never be made again. He describes the movement of the mounted men and Indians across a flat about five miles long with a thousand deer in front of them. The flat broke off steeply into a canyon tributary to the Grand Canyon, down which it was proposed to drive the animals. Watchers stationed at the edge of the flat discovered only two head of deer, which were finally driven into the canyon. Curiosity, no doubt, led the older and tamer deer to follow the drive, and at all times the number in the rear was as large as that ahead.

The present situation is serious. The emergency hunting season agreed upon by the Forest Service and the State of Arizona, and lasting for about one month, resulted in the taking of less than seven hundred specimens. Crating and shipping for distribution to zoological gardens, parks, and individuals equipped to care for live deer has been discouraging, due to unfavorable weather conditions and difficulty in trapping. Many of the specimens injured themselves, none of the fawns lived, and older specimens have died in transit or soon after reaching destination. Mr. Musgrave believes that successful shipment can be made if some means of domesticating the fawns can be found, so that they will not injure themselves when crated and shipped. It looks like the most humane method would be modification of hunting regulations and an appeal to sportsmen to reduce the numbers to a point where the range will support the remaining herd, as recommended in the report of the committee appointed by the late Secretary Wallace to investigate the situation, suggesting systematic killing only as a final measure.

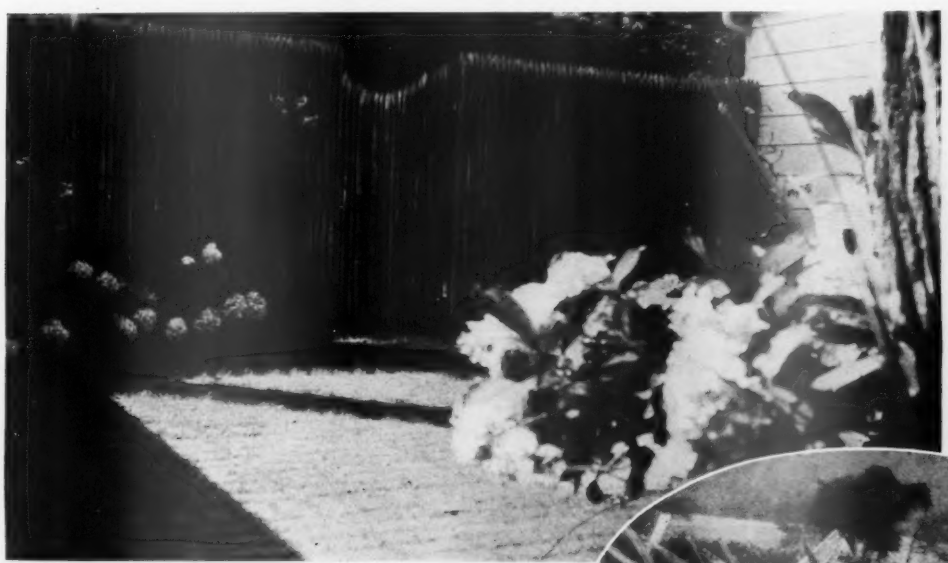
FENCES

BY C. R. ANDERSON

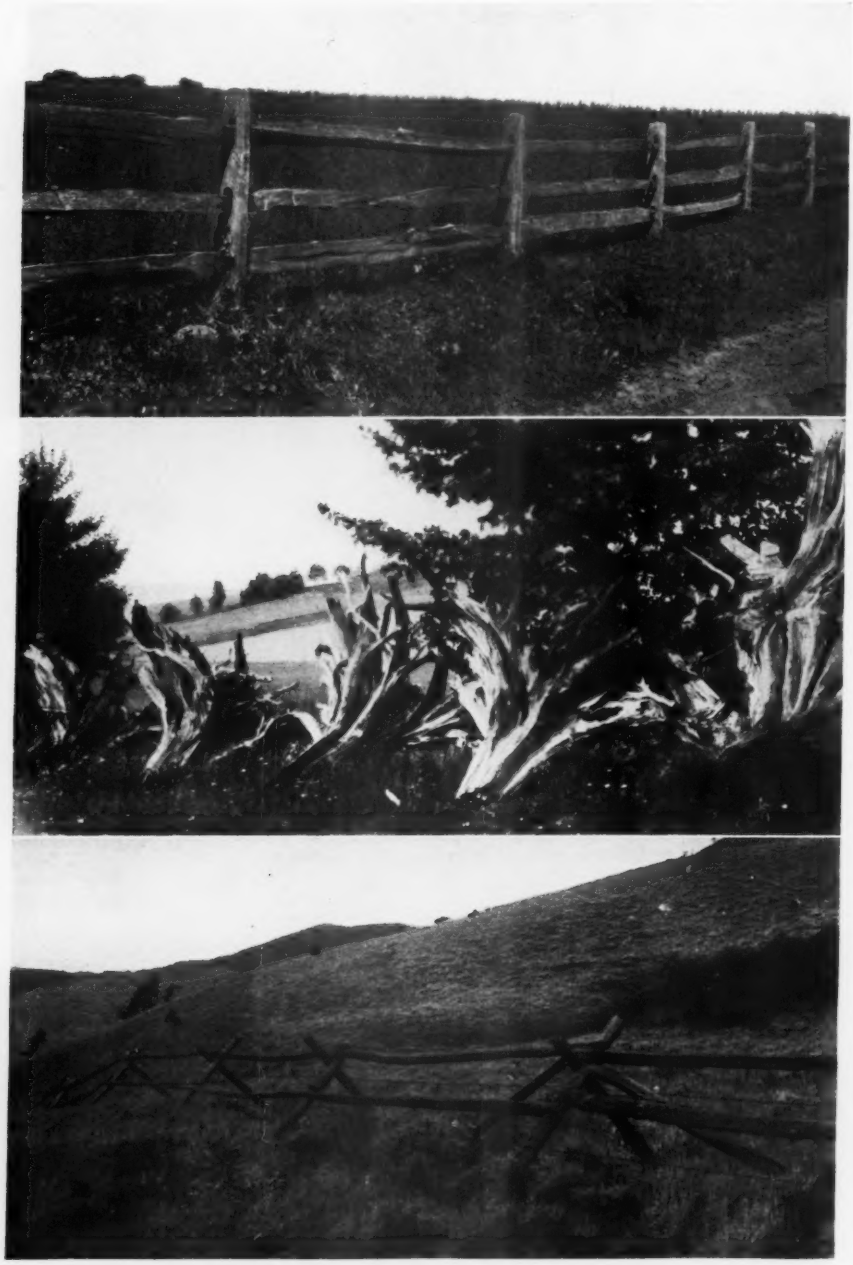


NOT many years ago I heard a farmer remark, with a certain picturesque emphasis, "I'd just as soon sleep outdoors as in a house without a fence around it." At that time I didn't feel just as he did. Later, as I listened (cursing softly to myself) to the repeated protests of a mother pig and her litter, which, contrary to all experiences, were shut out of a southern forestry camp by a good hog-proof fence, the wisdom of the farmer's remark was driven home. I recall another time when I should have agreed entirely with him. This was the occasion of an attempt to sleep in an unfenced camp, which was invaded by a herd of belled cattle between 11 p. m. and 4 a. m.

A lot of people believe that fences are useful. Witness the statement in the 1922 Yearbook of the United States Department of Agriculture, under the title "Timber, Mine or Crop," that the fencing used annually in the United States is equivalent in standing timber to 21,600,000,000 board feet. Why, that is enough to build a million homes of the six-room cottage type; or to keep a wood fire burning on the hearths of these homes all winter for ten years; or to fence



ARTISTIC AND WIDELY USED IS WOVEN WOOD FENCE. MADE OF LIVE CHESTNUT SAPLINGS, WOVEN TOGETHER WITH WIRE, AND BACKED WITH HORIZONTAL WOOD STRIPS, BUILT IN SECTIONS AND READY TO ERECT. THE OVAL INSET SHOWS A "SWEDE" FENCE FASHIONED WITHOUT THE USE OF POSTS OR NAILS AND USED TO INCLOSE OPEN FIELDS OR PASTURES



FENCES FROM HERE AND THERE

Upper—A post-and-rail fence made with mortised posts and pointed rails. It makes a wonderfully strong and lasting fence, though expensive to build when labor is high. Seldom seen except in the Middle Atlantic States.

Middle—Remnant of an old stump fence, once common in many sections of the country. These are all white pine and apparently of big trees, probably part of the great stand of white pine which once grew on Pennsylvania's hills.

Lower—A Jack fence, or pole fence, in the sage-brush country of Montana. Miles and miles of such fences are found on our western ranges.

in the United States 100 times over, five boards high, with a post every ten feet. In fact, the quantity of lumber used for fences is only exceeded by those used for fuel and for lumber. This couples up fences and forests in a partnership that can hardly be ignored.

There are so many types of fences that only pictures can give a fair idea of them. Some of them are common enough. Many of us picture first, in thinking of the word, the one we used to whittle or the one that retarded our diligent progress in attempting to escape an irritated bull or an enraged watermelon-grower, or maybe the one blessed with the knot-hole which might otherwise have obliterated an important ball game.

The man and the woman of the outdoors is continually encountering fences. It may be the "drift" fence of the stockman of the high mountain country of the West, the wire fence of the homesteader of the mountain valley, the tortuous "snake" fence around the hill fields of the Southern Highlander, the stone fence of a New England valley farm, the stump fence of some recently cleared Lake States farm, or a would-be barrier of a half dozen other places and names. One can hardly express surprise at the question, "Just what is a fence, anyway?" Is it wood, or wire, or stone? And if it is of stone, are the stones set in cement or put up "dry"? If it is of wire, how many separate strands, or is the wire woven, and are the wires smooth or barbed? And if of wood, is it boarded solidly or are the materials placed at some distance from each other; and, if the latter, are they placed horizontally, or vertically, or neither? Let any and all answer who have stepped over, climbed over, crawled under, slipped through, or gone around, or left a portion of their clothing on such an obstruction.

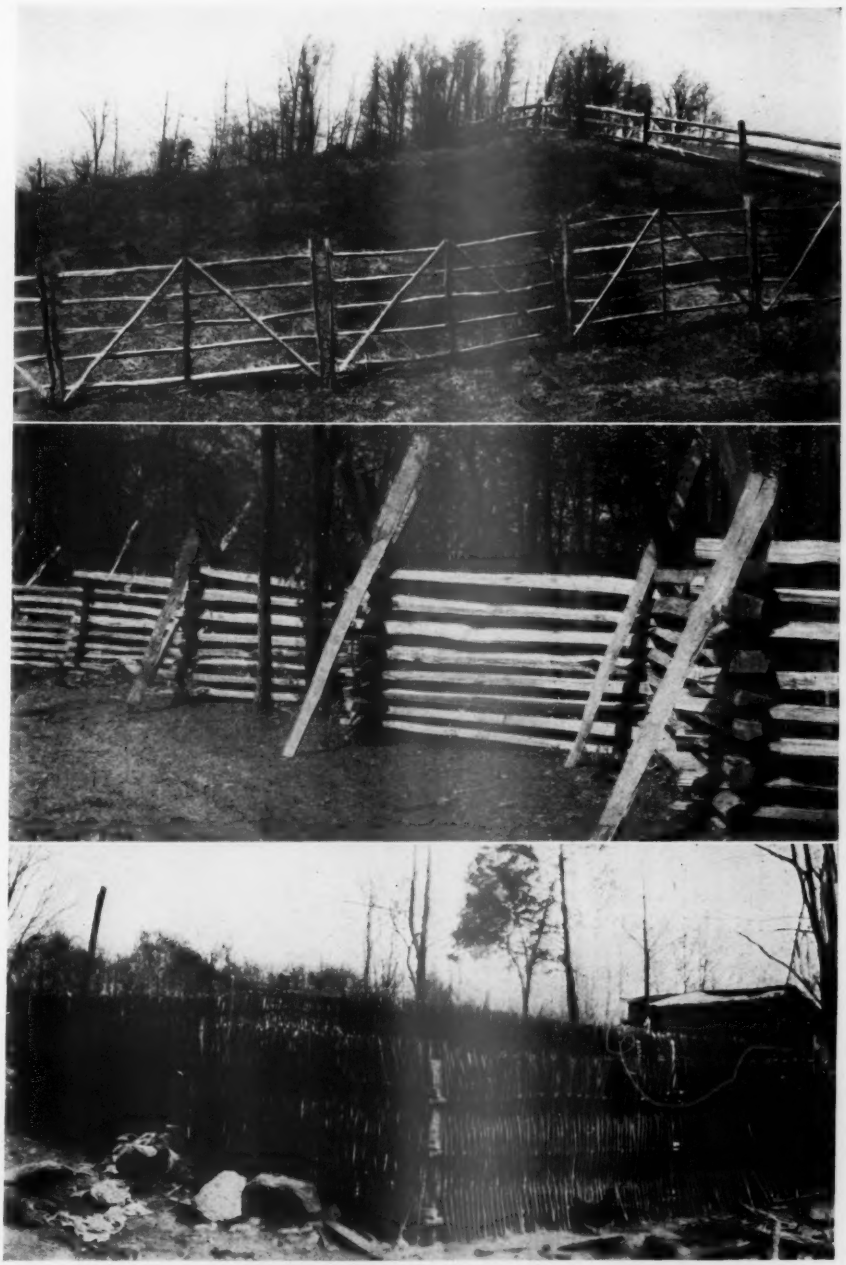
Webster probably answers our question as well as it can be answered. His dictionary says this: "Fence—An inclosure about a field or other space, or about any object; esp., an inclosing barrier, as a structure of wood, stone, or wood and iron, or other materials, intended to prevent intrusion from without or

straying from within. A hedge, wall, or ditch and bank legally constitutes a fence, as well as a structure of posts and boards, palings, rails, or wire."

Webster, however, has much to learn about legality of fences. There is great variation among the laws of the states of the United States as to what makes an acceptable fence. In fact, some of our Southern States have no fence law at all, which means that the farmer and the forester must fence against all kinds of animals running at large if the former is to protect his planted crop, or the latter to give his pine forest an opportunity to reproduce.

Fences are usually built to keep the common domestic birds and animals within, or to keep them without, a designated area, or for excluding crowds of people from little islands of grass or flowers in densely populated cities, for guarding dangerous highway curves, for hiding unsightly views, for purely decorative effects around houses and gardens, and, alas! at times for spite. I can remember with great delight how a rich man in a small western town was served with an injunction, so that he had to saw off two feet from the top of a spite fence which he had built to cut off the sight of his house from his neighbors and to exclude the light from his neighbors' windows.

Probably there is nothing more picturesque than the old rail and stump fences. And what can add more to the prim, cheerful aspect of a garden than a low picket or lattice fence of white or green? What is more restful than the rustic effect produced by fences fashioned from crooked hewn timbers or round ones with the bark on? Perhaps fences are to look at as well as to exclude and to hamper.



AND A FEW OF STILL DIFFERENT TYPE

Upper—**Made entirely of chestnut, this fence can be moved easily from place to place, as each panel is separate from every other. It is most generally seen in the section of Pennsylvania where fox-hunting is a common sport.**

Middle—**An old, familiar fence, called variously a Virginia rail, a snake or worm fence. This is the type of fence that brought the "Great Emancipator" fame as a rail-splitter. Black walnut and white pine were chiefly used in their construction. These fences are very common in the vicinity of the Southern Appalachians.**

Lower—**A woven brush fence surrounding the garden of a soft-coal miner in western Pennsylvania. When carefully put up, this type of fence is quite effective.**

But, to get back to the practical side, there is a distinct relation between the invader, whose passage we wish to obstruct, and the type of fence. A common saying is that a fence must be horse-high, hog-tight, and bull-strong. Woven-wire fences are considered best for hogs, sheep and goats, and farm poultry. Barbed-wire fences are so dangerous to horses that in some states fences on

[*Continued on page* 110]

Tree Stories for Children

The Poplar Sisters

By Mary Isabel Curtis

ONE morning the people of the earth were very much surprised to see the sun come up ahead of time, for Helios, the god who drove the chariot of the sun across the sky every day, was a most methodical person. He was always so exactly on time that you could set your watch by him and be quite sure that it was right. But this morning the sun rose a great deal too soon.

The reason for this was that young Phaëthon, the son of Helios (and a most conceited boy), had boasted that he could drive the chariot of the sun as well as his father could. So this morning he slipped out before his father was awake and borrowed the chariot and horses. And he was going to let every one see what a strong and clever boy he was.

But Phaëthon soon found that he was not so strong as he supposed. Although he pulled with all his might upon the reins, he soon lost control of the horses. First, they ran too far away from the world, so that the earth grew cold and all the crops were frosted; and then they turned and dashed so close that all the trees were scorched and the houses set on fire, and everybody feared the world was going to be utterly destroyed. The people of the earth called to Jupiter for help, and Jupiter, enraged at what young Phaëthon had done, killed him with a thunderbolt and hurled him down to earth, where he fell into the river Po.

Phaëthon's three sisters were so heartbroken at the dreadful fate of their brother that they wept and begged the gods to give him back to them. In fact, they made such a disturbance that Jupiter became angry at them and threatened to punish them, too, if they did not stop making so much commotion; but instead of trying to be quieter, they shed more tears than ever. Then Jupiter punished them, as he had said he would. He turned them into three tall, dismal poplar trees on the bank of the river.

But the trees kept right on weeping; only now their tears were different. As they fell they hardened into clear, yellow amber and dropped into the stream. And people found these amber tear-drops in the water and made necklaces and ornaments of them.

I shouldn't wonder if they looked a good deal like the amber beads we see today.

New Plants from China

By E. H. Wilson

Arnold Arboretum

AMONG the many surprises of the Chinese flora not the least is its richness in conifers. A large number of species of Picea and Abies have been described in recent years and many are now in cultivation in America and Europe. I have introduced some thirteen species and two varieties of Picea and seven species of Abies, all considered new. Patience is very necessary in raising conifers from seeds, and still greater patience in waiting until they develop their true character and prove their value. The fruiting of Picea and Abies is intermittent and depends very largely on weather conditions in the spring, when the flowers are open. A late frost may ruin everything. In 1910 the Fates were propitious and the conifers of western Szechuan fruited abundantly. These seeds were sent to the Arnold Arboretum, and by that institution distributed widely in Europe as well as in the United States. They germinated freely, and now, after fourteen years, it is possible to tell a little about the plants.

The climate of Massachusetts is both rigorous and changeable, and plants—evergreens especially—have to be tough in constitution to withstand its severities. Of the new firs from China, *Abies Fargesii, A. chensiensis,* and *A. recurvata* promise to be hardy and useful species in the Arnold Arboretum. The spruces, with the exception of the flatleaf species, have proved even more adaptable, for all introduced are thriving, and it appears probable that several will be of great value to New England and

THE WONDERFUL CHINESE *ROSA HUGONIS* WHICH "CAPTURED THE GARDEN LOVERS OF AMERICA" WITH A BLAZE OF YELLOW GLORY. IT WAS FIRST RECEIVED BY THE ARNOLD ARBORETUM WHICH REPORTS: "AT THE MOMENT IT IS EASILY THE MOST POPULAR SPECIES IN THIS COUNTRY"

elsewhere. There are three very promising new species—*Picea asperata, P. Balfouriana,* and *P. Wilsonii.*

In its juvenile stage, *P. asperata* is a sturdy-growing plant with relatively thick, spreading branches and dark-green or glaucous leaves, stout, spreading on all sides of the shoot, very pungent, and from one-half to three-fourths inch long. The shoots are orange brown, glabrous, or puberulous; the winter buds are nearly the same color as the shoots, ovoid, swollen at the base, non-resinous, with bud-scales scarious and free at the apex. In a natural state this is a tree from 100 feet to 150 feet tall, with horizontally spreading, slightly decurving branches, upturned at the ends, and old trees are very spirelike in appearance. The bark is gray brown, fissured, and peels off in thin flakes of irregular shape; the cones, which vary from three inches to five inches in length, are fawn gray. Some of the trees are very glaucous in appearance. This is the Chinese homologue of the Norway spruce and is the common quadrangular-leafed species of northwestern Szechuan, where extensive and almost pure forests of this tree occur. It was discovered in 1903 by myself, and in 1910 it was introduced into cultivation by seeds I sent to the Arnold Arboretum. Its two varieties (*notabilis* and *ponderosa*), which differ in size of cone, shape of cone-scales, and other minor characters, were also introduced at the same time, but as they grow in the Arnold Arboretum they are at present indistinguishable from the type.

"AMONG THE MANY SURPRISES OF THE CHINESE FLORA NOT THE LEAST IS ITS RICHNESS IN CONIFERS. A LARGE NUMBER OF SPECIES ARE NOW IN CULTIVATION IN AMERICA AND EUROPE"

As we know it under cultivation, *Picea Balfouriana* is dense in habit, with arching, overlapping branches and acute, dull green half-inch long leaves, pointing forward and downward, with prominent stomatic lines on the undersurface. The shoots are slender, pale gray, and pubescent; the winter buds chestnut brown, ovoid, non-resinous, with closely imbricated, puberulous bud-scales. In its adult stage this spruce is a tree upward of 100 feet high and among the tallest of the Chinese species. The trunk is mastlike, with short, spreading branches, which give a spirelike appearance to the tree. It has gray, deeply furrowed bark and handsome, violet-purple cones, with membraneous, flexible cone-scales undulate and laciniate at their apices. The wood is resinous, close-grained, and easily worked. The timber is valued for general construction purposes. This species is a common constituent of the high-level forests of the Chino-Tibetan border land between elevations of 10,000 feet and 12,500 feet and is the most alpine of the Chinese spruces.

In young plants of *P. Wilsonii* the branches are numerous, spreading more or less upturned at their extremities, with dark green acute leaves, the upper inclined forward, the others spreading more or less in one plane at right angles to the shoot, from one-half inch to three-quarter inch long and lustrous on both surfaces. The shoots are slender, pale gray, glabrous or nearly so; the winter buds are gray to dark brown, ovoid, non-resinous, with firmly imbricated, erose bud-scales. As it grows in the forests of central China, this is a tree of moderate size, not exceeding 75 feet in height and seven feet in girth of trunk, pyramidal in outline, with short, dense, horizontally spreading branches. It is fairly common on the higher ranges of northwestern Hupeh at altitudes between 6,500 feet and 8,000 feet and appears to be even more plentiful in the province of Shansi, especially on Wutai-shan. It was discovered and introduced into cultivation in 1901 by myself, and in 1909 William Purdom collected seeds of this spruce in Shansi, and the plants growing in the Arnold Arboretum were raised from his seeds.

The Orient is notably rich in ornamental shrubs, among which are a number of roses of great beauty. One species of recent introduction that has captured the garden-lovers of America is *R. Hugonis,* from the mountains of central and western China. At the moment it is easily the most popular species in this country. The habit leaves nothing to be desired. The stems are ascending, with the outer ones arching gracefully to form a rounded bush from four to six feet tall. It is among the earliest of roses to open its blossoms, and so freely are these borne

[*Continued on page* 91]

Score Cards for Trees and Woodlands

A New Way of Teaching Elementary Forestry

By James B. Berry

TREES and woodlands may be judged and scored just the same as cattle, hogs, seed corn, and other products studied in agricultural colleges and vocational high schools. Live-stock judging contests have probably done more to give to students a definite conception of the points which go to make up the ideal animal for a given breed than all of the lectures and text-books combined. Such contests have the elements of competition, close observation, and actual contact with the specimens studied. The National Dairy Show last year proved that pupils of high-school age were quite as able to correctly place the animals as were more mature college students and stockmen who had been in the work for years.

Even younger school pupils of ten and twelve years of age take readily to the score-card method of study, and the great interest in forestry on the part of boys and girls in the public schools, vocational schools, Boy and Girl Scout camps, Camp Fire groups, and others has suggested the use of the score card in studying trees and woodlands.

In an effort to meet this need for a score card, the agricultural teachers of Crawford County, in Pennsylvania, have devised two types of cards similar to those in use for placing dairy stock, beef stock, hens for egg production, corn, potatoes, and fruit. A statement of points is made to obviate the writing of reasons. Each of the points is given equal weight and a score for the comparison of points is given equal weight with the final placing. This does away with written reasons for placing and works just as well.

At the beginning of the contest, the judge in charge discusses the points to be looked for in placing the individual tree, specimens, or woodlands. This is an elaboration of the explanation of points given on the reverse side of the score card. The group is then given 20 minutes in which to make the placings, after which the judge makes his placing and explains the points which he has considered.

The use of score cards for trees and woodlands is in the pioneer stage, and the writer of this article would appreciate suggestions from foresters, forestry teachers, and others for improving the cards reproduced below.

FOREST TREE SCORE CARD

Contestant's No._____ Date_____

Points Placing:	1st.	2d.	3d.	4th.	Score.
Form					
Adaptability					
Quality					
Market Value					

Score for comparison_____

Final placing:	1st.	2d.	3d.	4th.	Score.
Order of placing trees					

Final score_____

Explanation of Points

Form: Stem straight, long, undivided, cylindrical, clear of branches, free from fire scars, lightning scars, and other mechanical injury; crown full, uniform, composed of small branches, and free from dead and dying parts; roots unexposed.

Adaptability: Tree adapted to soil (agricultural, non-agricultural), moisture (wet, moist, dry), climate (early and late frosts), and light conditions (tolerant, intolerant); vigorous appearance; rapid growth; freedom from disease.

Quality: Number, size, and grade of logs; freedom from crooks, knots, and other defects; cylindrical shape; tree class (dominant, intermediate, suppressed); relative amounts of sapwood and heartwood.

Market Value: Value of wood product based upon market demands for the particular kind of wood; relative value at present and some time in future.

Use of Score Card: Four trees are lettered A, B, C, and D. The trees are then placed according to each of the points. Finally the trees are placed, taking all points into consideration. Each point is of equal weight, and the scores for the points are averaged, and this average is averaged with the score for the final placing, which gives the final score. The object of this arrangement is to do away with written reasons.

FARM WOODLAND SCORE CARD

Contestant's No._____ Date_____

Points Placing:	1st.	2d.	3d.	4th.	Score.
Composition					
Stand					
Condition					
Age classes					

Score for comparison_____

Final placing:	1st.	2d.	3d.	4th.	Score.
Order of placing woodlands					

Final score_____

Explanation of Points

Composition: Kinds of trees (based upon value of wood to farm and industrial uses); adaptability of trees to soil, moisture, light, and climate; absence of trees of low value, such as wolves, weed trees, deformed trees, and overmature trees.

Stand: Soil fully utilized (fully stocked), as indicated by forest conditions (forest floor of duff, leaves, leaf mold, etc., and absence of ground cover of grasses, weeds, and brush). Absence of open spaces in the stand.

Condition: Vigorous appearance of individual trees of the woodland; absence of suppressed, dead and down trees, and logging debris.

Age Classes: Proper proportion of age classes (seedlings, saplings, poles, etc.) to insure continuous production; proper distribution of age classes, so there may be young trees to take the places of mature trees removed in cutting. This point may be disregarded in judging an even-aged stand or plantation.

Use of the Score Card: Four woodlands are lettered A, B, C, and D. The woodlands are then placed according to the rank for each of the points. Finally the woodlands are placed, taking all points into consideration. Each point is of equal weight, and the scores for the points are averaged, and this average is averaged with the score for the final placing, which gives the final score.

THE PERSIMMON'S FARTHEST NORTH

By S. J. RECORD

THE most northern place where the persimmon (*Diospyros virginiana*) is known to grow naturally is Lighthouse Point, in New Haven, Connecticut. This is the only station for this tree in New England, and the nearest to the south is in western Long Island, fully 60 miles away.

THE PERSIMMON TREES ON LIGHTHOUSE POINT

This picture was taken in 1912, but the trees look about the same today, only there are fewer of them.

How this isolated outpost came to be established is purely a matter for conjecture. It is possible, of course, that the Indians or the early white settlers may have been the agency, but there is now no way of finding out. As early as 1831 the species was listed as growing naturally within five miles of Yale College, though no exact location was mentioned.

A report by the State Geological and Natural History Survey of Connecticut, published in 1910, says of the persimmon: "In New Haven, at Lighthouse Point, there is a grove of about 125 small trees on the beach, not far from the water's edge. Here they are exposed to fierce winds and winter storms, which drive the salt water up about them; consequently they are not in a flourishing condition."

Within the last ten years nearly a hundred of these trees died or else were cut down because they interfered with the development of the Point as an amusement park. The survivors of the interesting colony are in two clumps, the larger containing 21 specimens, ranging in diameter from 3 to 8 inches and in height from 18 to 25 feet. The ground about them has been covered with a thick layer of cinders as part of the beach walk.

The other clump, which is about 100 feet to the west of the larger one, contains 8 trees, from 6 to 10 inches through and upward of 25 feet high. The only trees near by are a few scrubby hackberries. The much-trampled sandy ground about them is partly covered with grass and weeds.

Although the persimmon trees bear fruit occasionally, there is no reproduction and no possibility for any under the present artificial conditions. It will not be very many years before the few remnants of the ill-fated colony are forced to give up their heroic struggle for bare existence.

Measuring Up Yosemite's Trails

YOSEMITE'S 600 miles of trail are being measured by means of a cyclometer attached to a bicycle wheel. This contrivance records the revolutions of the wheel, and the number of revolutions multiplied by the wheel circumference gives the accurate trail distance. At first

Photograph by J. V. Lloyd
Courtesy National Park Service

E. C. SOLINSKY, CHIEF FORESTER OF YOSEMITE NATIONAL PARK, MEASURING THE 600 MILES OF THE PARK'S TRAILS WITH A CYCLOMETER

Forester Solinsky, who is measuring the trails, attached a short handle to the wheel and started out on foot, pushing the cyclometer before him. This was slow going, so Mr. Solinsky lengthened the handle, mounted his horse, and continued his measurements with speed and comfort. Next summer all the trails so measured will be properly signed.

PANORAMA OF HARPERS FERRY FROM MARYLAND HEIGHTS

A National Boulevard Along the Wooded Potomac

By Blanche C. Howlett

(With Illustrations by Courtesy of the Baltimore and Ohio Railroad)

THE plan to extend the parks of the Nation's Capital to include several outlying sections of historic interest has met with enthusiastic response. A Park Commission, armed with a purchasing appropriation and at last empowered to act, gives every reason to hope for real accomplishment along these lines, if the appropriation authorized in the bill is passed by Congress.

Running parallel with the shore of the lazy and beautiful "Patowmack," beloved of Washington, lies the Chesapeake and Ohio Canal, now abandoned and fallen into disuse. But back in the days when Destiny was writing most rapidly the beginnings of the history of our great Republic this waterway was the scene of active commerce, with boats busily plying up and down its length from tidewater, at Georgetown, to Cumberland, Maryland.

The proposal has been made that the Federal Government purchase this canal, to be used as the roadbed of a boulevard and parkway between Washington and Cumberland, Maryland. The suggestion is a most feasible one, in connection with the proposed acquisition of the virgin and historic forest tracts lying at the doorsill of the Capital City, which has already been discussed in the pages of this magazine. These two features of the program for park land acquisition are of outstanding desirability and should be strongly urged. In the matter of the proposed boulevard, the engineering feat has been accomplished, and filling in with the available soil on either side would be a comparatively small matter.

The canal is 184½ miles long, with an average width of 65 feet at the surface. The Federal Government should unquestionably own this strip of land as a parkway from the Potomac River to and including Conduit Road as far as Great Falls. The State of Maryland should also be interested in having, further, a magnificent boulevard, 185 miles long, from the Capital City to Cumberland, Maryland. This boulevard would offer features that commend themselves to the traveler—scenery and history. Shepherdstown and Harpers Ferry are two of the most interesting towns that the canal passes between Cumberland and Georgetown. At Shepherdstown, on the edge of a cliff overlooking the Potomac, is a monument erected to the memory of James Rumsey, inventor of the steamboat, though Robert Fulton is generally credited with this achievement. In 1787, on the Potomac River near Shepherdstown, James Rumsey made a successful demonstration of a boat propelled by steam.

SCENE ALONG THE POTOMAC RIVER EAST OF HARPERS FERRY, SHOWING THREE PHASES OF TRANSPORTATION—RAILROAD, CANAL, AND HIGHWAY

It is interesting to find that, in 1784, George Washington spent a night

at Bath, Berkeley County, Virginia, and James Rumsey, one of the proprietors of the tavern, showed Washington then his invention for propelling boats against the stream by a mechanical contrivance. Mr. Rumsey was afterwards made the general manager of improvements of the Patowmack Company.

The two branches of the Potomac unite about fifteen miles southeast of Cumberland and take an irregular course as far as Harpers Ferry, where stands the monument to John Brown. At Harpers Ferry the Shenandoah flows into the Potomac. Here the stream flows through a wild gorge in the Blue Ridge range. From Cumberland, Maryland, to Georgetown the canal passes through a land made beautiful by nature and interesting through history.

ONE OF THE PICTURESQUE OLD LOCKS ON THE CHESAPEAKE AND OHIO CANAL

The dream of George Washington's life was to see the East and the West connected by a navigable waterway. The West in those days was known only as a dense and extensive wilderness west of the Appalachian Mountains. Washington had the vision to see that a country of such vast extent could be held together only by closer bonds. As early as 1754, twenty years before the Revolution, Washington in person explored the proposed route for connecting the East and the West by the waters of the Potomac and Youghiogheny Rivers. The result of his efforts was the formation of the Patowmack Company, which was organized in 1785 with George Washington as president. The plan of improvement of the Patowmack Company was that of open-river navigation except at localities where the falls made navigation impossible, at which places lateral canals with locks were constructed. Navigation was opened in 1802, and the canals were in continuous operation until 1830, when the locks at Great Falls were abandoned. The expense of keeping the upper Potomac in a navigable condition was great, and the people began to see the feasibility of a continuous canal from tidewater, at Georgetown, to Cumberland, Maryland. To consummate this required the rights and privileges secured under the charter of the Patowmack Company to be surrendered. In January, 1824, The Chesapeake and Ohio Canal was authorized by act of the Virginia Assembly; in December, 1824, by Maryland, and by the act of Congress approved March 3, 1825. The Patowmack Company gave its final consent August 15, 1828. These acts constitute the charter of the Chesapeake and Ohio Canal, which succeeded to the rights and interests of the Patowmack Company.

Ground was broken for the canal by John Quincy Adams, President of the United States. Old newspapers give interesting descriptions of the celebration. The directors of the Chesapeake and Ohio Canal Company met the honored guests, which included the President of the United States and his Cabinet, the representatives of foreign governments, and other high officials. The procession, attended by companies of militia, the Marine Band, and other bands of music, marched to the Potomac and embarked on a steamboat. Disembarking, the company marched to canal-boats lying in the old canal of the Patowmack Company.

The inspired reporter of the *National Intelligencer* wrote: "All Nature seemed to smile upon the scene. The senses of the company were regaled by a scene at once novel and really enchanting. The music of Moore's sweet song, 'The Meeting of the Waters,' poured its melody on the ear, so as to suspend the labor of the boatmen and charm to silence every voice."

THE "CAPITOL LIMITED" EN ROUTE THROUGH THE BEAUTIFUL POTOMAC RIVER VALLEY

Elaborate arrangements were made for the ceremony of breaking ground. The spot chosen was near a powder magazine at the head of Little Falls. Two companies of riflemen saluted the arrival of President Adams. Mr. Mercer, president of the company, handed Mr. Adams the spade. The President pushed it into the ground, but the spade struck a root. Mr. Adams tried it again with no better success; so he threw down the spade, stripped off his coat, and went seriously to work. The

multitude cheered and gave loud and unanimous applause. The canal was completed to Cumberland, Maryland, twenty-two years afterward, in October, 1850.

Baltimoreans had no interest in the Chesapeake and Ohio Canal. They had expended large sums of money on public roads to obtain the trade which the canal would deprive them of. The business men of Baltimore gathered at the homes of Mr. George Brown and Mr. Philip E. Thomas to discuss transportation. They organized the Baltimore and Ohio Railroad Company. Plans were made that when ground should be broken for the Chesapeake and Ohio Canal near Washington the corner stone of America's first railroad should be laid in Baltimore.

On the 4th of July, 1828, simultaneously with President Adams turning the first spadeful of earth for the Chesapeake and Ohio Canal, Charles Carroll of Carrollton, the only surviving signer of the Declaration of Independence, lifted the first spadeful of earth for the laying of the corner stone of the Baltimore and Ohio Railroad. When the venerable patriot pushed the spade into the ground he remarked, "I consider this among the most important acts of my life, second only to my signing the Declaration of Independence, if even it be second to that." A line to Ellicott Mills, Maryland, now Ellicott City, fifteen miles from Baltimore, was constructed.

THIS UNIQUE CUT IS THE REPRODUCTION OF AN OLD DRAWING OF THE FAMOUS RACE BETWEEN HORSE AND STEAM POWER. IN 1830 THEY WANTED TO SEE WHICH WAS BETTER, SO THIS RACE WAS HELD AND, AMID WILD EXCITEMENT, THE "TOM THUMB" ENGINE WON.

The name Baltimore and Ohio was chosen because the intention of its founders was to push construction from Baltimore to the Ohio River, thus uniting Chesapeake Bay with the great tributary of the Mississippi. Wooden rails were first adopted, and horses were first used for hauling the coaches over the rails. At one time the company experimented with a car which was carried before the wind by means of mast and sail. Peter Cooper, of New York, finally solved the problem by his little engine, *Tom Thumb*. By the first of December, 1831, steam-drawn trains were in operation to Frederick, Maryland. The idea of conveying passengers was an after-thought; it was the freight traffic which the Chesapeake and Ohio Canal would draw from Baltimore that caused the Baltimoreans to build the Baltimore and Ohio Railroad, and so the history of the Chesapeake and Ohio Canal and its great rival for western trade, the Baltimore and Ohio Railroad, is told at the same time.

The canal was wrecked by the freshet of 1889. The company could do nothing to put it in repair, and matters were taken to court. The court decided to issue a decree for the sale of the canal. Politicians interested in the West Virginia Central Railway made an effort, through an act passed by the Maryland Legislature, to sell this valuable property, worth millions, to that company for about two hundred thousand dollars. The decree issued by the court in 1890, providing for the sale of the canal, provided also that the sale should be estopped on condition that the trustees make the needed repairs by May 1, 1891, and operate it as a public waterway. It was repaired and traffic resumed until the spring of 1924, when it was badly damaged by the two floods that swept down the Potomac.

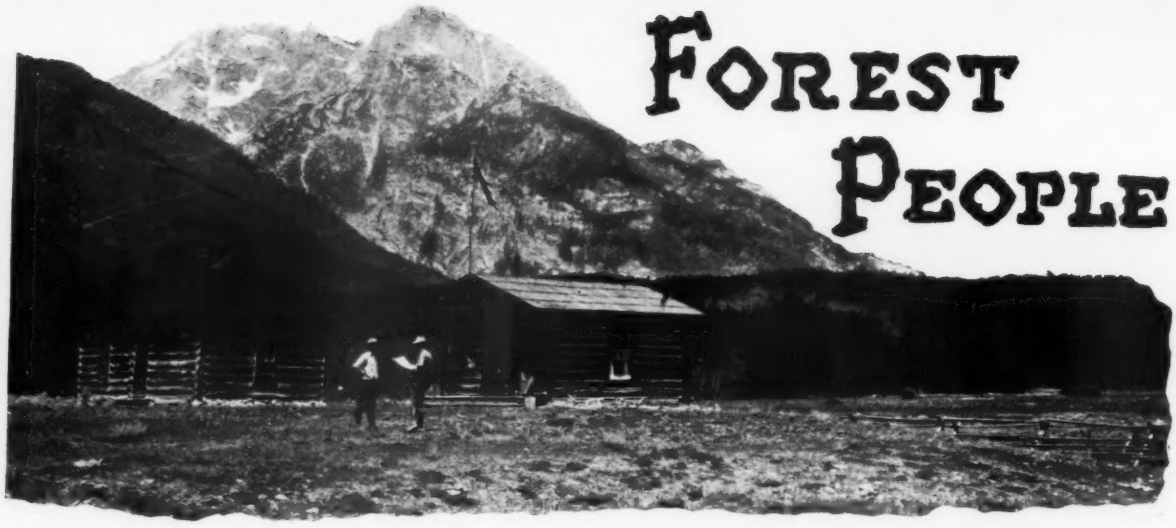
The old canal, so closely connected with Washington's early activities, should be forever preserved, in *some* form, as part of the treasured record of the young Republic, for it bears the actual imprint of the thought of this great American, expressed in concrete form. The "Washington Boulevard," running through this historic country, following the wooded shores of the quiet river that he loved so dearly—mile after mile of beautiful driveway leading into the city that bears his name—would eventually take its place among the great structures of the world.

Should the Nation let this opportunity pass?

New Plants From China

[*Continued from page* 86]

of roses to open its blossoms, and so freely are these borne as to transform the branches into sprays of flowers hiding the leaves, and the whole plant in a bouquet of soft yellow. The fruit is dark scarlet, ripens, and, unfortunately, falls early. In China it flourishes on rocky, semi-arid mountain slopes and valleys, reveling in good drainage, hot summers, and cold winters. It was discovered by a Welsh priest named Hugh Scallan, attached to an Italian mission, who sent a parcel of dried plants to the British Museum. When looking the material over, the authorities noticed some rose hips and sent them to Kew Gardens. In course of time these vegetated, and later, when the plants flowered, the rose was named *R. Hugonis* for its discoverer. In 1908 it was received at the Arnold Arboretum and soon afterward passed into American gardens.



FOREST PEOPLE

The Pine Pruner of Holderness

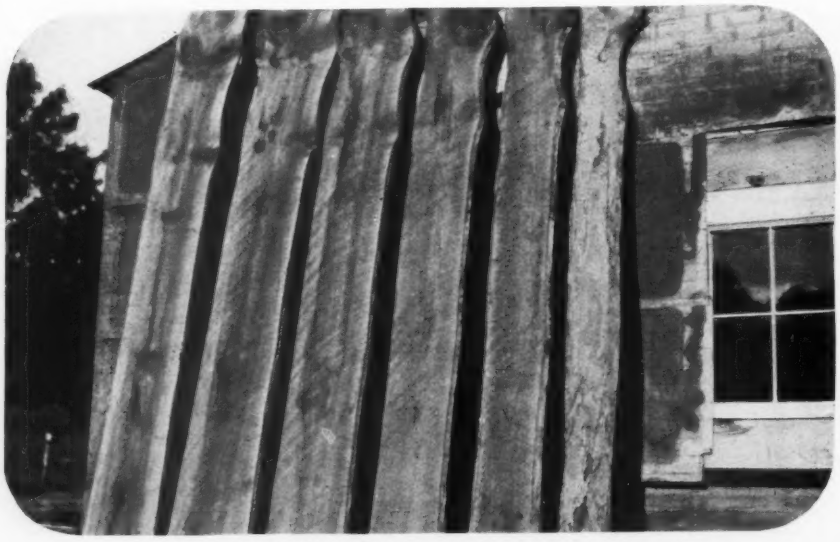
By Ovid M. Butler

ON A summer day a good many years ago a boy lay on his back in a pine woods in Massachusetts. His was a far-flung game—that of eluding an imaginary band of Indians. He closed his eyes, breathing deeply to regain his breath from a stooping run along the stone fence of a near-by meadow. Suddenly a small limb fell across his body. He leaped to his feet, genuine fear running through his strong, young frame. There was no one in sight who could have thrown the branch. He walked stealthily in a circle, the better to look behind all the trees. Yes, the wood was quite deserted—and very silent.

There had been no wind, nothing to jar a tough limb from the tree above him. It was all most strange and mystifying to the imaginative young mind. In his hand the boy still carried the branch. He examined it closely now. It was dead wood, but the end which had joined the trunk was freshly abrased, as if it had been pushed out by some force within the tree itself. The boy smiled sickly. "That darn old tree threw you; that's who!" he exclaimed, as he hurled the branch from him with a mighty swing. His Leatherstocking exploit seemed to have lost its zest, for he turned homeward. As he strode between the dense pines he observed, for the first time, that beneath each tree was a litter of young dead branches like the one which had so unceremoniously disrupted his play. The discovery filled his mind. In the meadow below he met a farmer driving two cows to the evening milking.

"What makes the pine trees shed their lower branches?" asked the boy.

The farmer took off his hat and scratched his head and then decided not to answer. Three other "neighbors" the boy met on his way home and asked the same question. They, too, took off their hats, scratched their heads, and on second thought decided not to answer.



FLITCH SAWED BOARDS FROM A PRUNED PINE TREE

The large amount of clear lumber in the lower part of these boards is due to early pruning and consequent absence of knots. The best time to prune, according to Mr. Pratt, is when the trees are three or four inches in diameter, when it has little effect upon the crown and results in confining the knot to the inside four inches of the first sixteen-foot log.

A few years later, when the boy had grown almost to manhood, he went to work in a sawmill. A small second-growth log came on the carriage. It was pocked with the scars of little limbs like the trunks of the trees in his "Indian" woods of earlier day.

"Why does the white pine shed its lower limbs?" the boy shouted to the old sawyer, who started to answer and then choked on his mammoth quid of tobacco. The log was against the great whirring saw now and being ribboned into thin, white boards. As they passed out over the sorting tables the boy examined them closely. Every limb scar extended into the wood as a knot, some penetrating only a few inches, others almost to the heart of the tree. But among them were buried knots that ended abruptly with clear wood on the outside, where there was no limb scar. How explain that?

"I have it," suddenly exclaimed the young man. "The knot stopped when the little limb fell off. From then on the tree could add clear wood where the limb was. I see now why the young pines spend forty or fifty years trimming their lower branches. It is so they can finally grow clear, high-grade lumber. Wonder if anyone ever thought to help them by pruning their trunks when they were young saplings? That ought to give 'em a chance to grow clear lumber at once, without fighting off their lower branches for half a century."

. . . . . .

There were six or eight of us, foresters all, who drove our cars into the New Hampshire hills last summer to visit the young man. He isn't young now, of course; he's past fifty. His name is O. M. Pratt, and for twenty-five years and more he has been operating a "timber farm" of some two thousand acres on the outskirts of Holderness, four miles from Plymouth.

"I came up here on a coon hunt," he told us, "but when I saw these abandoned farms coming up to young, fast-growing white pine I made up my mind I'd buy several and try out my boyhood idea of pruning pine. I never could get that idea out of my head. I believed it would pay, and now I know it will."

As for us foresters, we were a bit skeptical about the paying attributes of pruning a young forest. It didn't look practicable, going around sawing limbs off of small trees for a distance of from 16 to 18 feet from the ground. But we kept our peace and spent the afternoon with Mr. Pratt, going over his forest, inspecting his pruning work, asking him a million questions, pinning him down to figures, and looking at boards sawed from trees that had been pruned years ago and boards from trees that had never been pruned; and when we left, there was not a skeptic among us.

MR. PRATT EXHIBITS A PRUNED WHITE PINE

This tree, which is probably not more than thirty years old, is pointed out by the owner as one from which he will be able to cut a more than ordinary amount of clear lumber because early pruning has put the knots in the middle of the log. He estimates that this kind of forestry increases the value of his lumber $40 a thousand.

Of Mr. Pratt's forest, about one-half is "pine woods" and one-half hardwoods. He is carrying on his pruning operations in white pine only, because he says it does not pay to prune red pine. He has gone about his forest work in a very systematic and far-sighted way, clearing up his pine woods by judicious thinnings which remove suppressed trees and create conditions favorable to the young, thrifty, wood-producing trees to be pruned. His thinnings have removed about 200,000 feet of pine lumber annually and some 200 cords of hardwoods. His logs are sawed at a small mill right on the place.

Pruning of white pine began about twenty years ago, with the help of F. N. Knapp, who has also been interested in the subject for a number of years. To date, some 200 acres have been pruned, the prunings usually following the clean-up thinnings, and thus are restricted only to trees which will form the final crop. The best time to prune, Mr. Pratt believes, is when a tree is three or four inches in diameter. At this size, pruning does not seriously affect the tree's crown, and in twenty years sufficient clear wood has been added to make a cutting profitable.

The trunks of the trees are pruned to a height of sixteen feet. A short cross-cut saw attached to a pole is used, and with this instrument one man can prune six sixteen-foot logs an hour. Both dead and live limbs are sawed off, the cut being made as close to the bole of the tree as possible. "Better to remove the bark as far as the live tissue than to leave a stub," said Mr. Pratt.

That pruning hastens either the height or diameter growth is not claimed, but there is no doubt that it does raise the grade and value of the wood grown by the tree. This was clearly shown at Mr. Pratt's sawmill, where boards from pruned and unpruned trees were compared. The portions of trees which had been pruned fifteen or twenty years ago had added clear wood from the date of trimming, while the unpruned portions carried knots from

heart to bark. One of the photographs clearly shows this difference.

Now, the reader may wonder what the difference means in the selling value of the lumber. Almost anybody knows that clear white pine, without knot or blemish, brings fancy prices. Mr. Pratt isn't cutting many pruned trees yet, but when he does he has no difficulty in selling the lumber for $65 a thousand, whereas he is glad to get $25 a thousand for the boards from unpruned trees.

"I figure pruning increases the value of my lumber about $40 a thousand," said Mr. Pratt, speaking with New England conservatism.

"That means," one of us said, "that if you prune and, at the end of twenty or thirty years, cut 20 thousand feet to the acre, you have increased the value of your timber crop $800 an acre. Whew!"

"That's right," he said; "that's why I'm pruning pine."

The Latest "Covered Wagon"

By John C. Burtner

A COMPLETE and modern five-room house built inside one huge Douglas fir log and all mounted on a five-ton truck is the latest in "covered wagons" in the West.

Mr. and Mrs. C. E. Cave, who give their residence as "any place in the Northwest," are the owners of the strange equipage, and they passed through the campus of Oregon Agricultural College and paid a visit to the forestry school on their way East. They declared they were going to the other side of the Rockies to show the folks there what the Northwest produces in the way of trees.

The mounted log is 22 feet long, 8 feet through at one end and 7 feet at the other. It was cut from a huge fir, 275 feet in height and 12 feet through at the butt, which grew near Longview, Washington, the new home of the Long-Bell Lumber Company. Foresters estimated the age of the tree at 2,100 years, making its origin go back nearly two centuries before Christ.

The big log section was hollowed out by using special saws, after which partitions were built in, dividing the space into a living room and bed room combined, kitchenette, breakfast nook, library, closets, shower bath, and lavatory. Two full-sized doors, front and rear, afford easy entrance and exit. The house is electrically lighted and piped with a pressure water system.

The natural bark remains on the log, but in wet weather a canvas cover is kept on in order to forestall the day when the bark will loosen.

The Nation's Living Christmas Tree

ON Christmas Eve President Calvin Coolidge set alight a living tree—the National Community Christmas tree—with ceremony quite as significant as any formal pageantry pertaining to national affairs, thus recognizing officially a custom that is participated in by many people all over the country.

The tree, which the President graciously accepted for the nation, was a living spruce, thirty-five feet high, and was presented by The American Forestry Association. In making the presentation Ovid M. Butler, Executive Secretary of the Association, said:

"Mr. President, we extend to you our Christmas greetings, and with them this Christmas tree, which it is my honor to present through The American Forestry Association. It is a living, growing tree, symbolic of the spirit of Him whose birth we celebrate tonight. Its roots are of the soil; its leaves are evergreen—signs of vigorous life and continuous service.

"We are very happy, Mr. President, that by your gracious presence here tonight this tree becomes in fact the nation's living Christmas tree, typifying in the highest degree that communal spirit of kindness and all-embracing love which makes for 'Peace on earth, good will to men.'"

More than a thousand people crowded around the lighted tree. Led by the brass quartet of the Army Music School, Christmas carols were sung by the assembled throng, these being followed by a special Christmas concert by the United States Marine Band.

The American Forestry Association is urging the use of the living Christmas tree as a conservation measure and one that is in complete harmony with the early significance of Christmas. This tree will stand permanently, growing, it is hoped, from year to year, and will be lighted each Christmas Eve, serving as the nation's emblem of the season.

National Photo

JUST AFTER THE TREE WAS LIGHTED

The President and Mrs. Coolidge, with a group of friends and officials, standing beside the Nation's "Living Christmas Tree."

Conservation Progress in Congress

ASIDE from the introduction of the Woodruff-McNary bill, which is mentioned elsewhere in this issue, other forestry and conservation legislation had made progress up to the time of going to press.

The items for Federal co-operation with states in fire protection and for the acquisition of National Forest lands included in the agricultural appropriation bill stood at $660,000 and $1,000,000, respectively, at the time the bill passed the House. These are the figures approved by the Bureau of the Budget. On January 5 this bill was passed by the Senate with no important changes affecting forestry, except the raising of the item for camp-ground development on National Forests from $25,000 to $50,000. At the time of going to press the bill was in conference.

On January 5 the Alaska Game Commission bill, S. 2559, authorizing the creation of a game commission, to co-operate with the Secretary of Agriculture in the administration of the game resources of the territory, and establishing fundamental principles for game administration, was passed by the House and at the time of going to press was in the hands of the President for signature.

The Public Shooting Grounds bill, H. R. 745, S. 2913, came up early in January for consideration in the Senate, but was passed over, and there is danger that it will not be passed this session unless there is more vigorous demand than at present.

The bill for the establishment of a National Arboretum along the Anacostia River, near Washington, D. C., introduced by Senator Pepper, of Pennsylvania, had not been reported to the Senate up to January 7. A hearing before the House committee was held on January 14.

The Upper Mississippi Wild Life Refuge Bill, passed last session of Congress, but carrying certain restrictions which somewhat defeated its purpose, is in need of amendment. A joint resolution is now in the hands of the committee chairman of both houses which has the approval of the Director of the Budget and which is designed to correct the faults of this bill. The agricultural appropriation bill carries items totaling $400,000 for further acquisition of land and for expenses of administration of the new refuge.

Mule Days

By E. A. Woods

RANGERS, lend your ears! The Kid's going to read a piece of poetry. Didn't write it yourself, did you? No? Well, then, go ahead and spill it."

The young ranger unfolded a soiled piece of paper and tilted it so that the light of the camp fire fell upon the open page.

"It's about a mule," he drawled.

"I'm feelin' sad already," remarked the ranger, squatting cowboy fashion in the shadow.

"If her name is Maude, I'm takin' the count without sparring."

Undaunted, the young ranger began to read:

"Sure he ain't no howlin' beauty,
'Cause he wasn't built for show;
And his temper ain't angelic,
Nor his voice ain't sweet and low;
And his ethics have no bearin'
On the plan of Golden Rule,
But he fetches home the bacon,
Damn his skin—the burro mule."

Through five paragraphs he continued to the end without interruption, which spoke well for the poetry. When he had finished, the ranger who had spoken first turned to an old ranger from the Lewis and Clark: "How'd you like it, Charlie?" he said.

"That line where the fellow calls the mule 'a lop-eared, bat-eyed, wabble-jawed, ding-busted, knock-kneed fool' is just about right," replied the old ranger. "Only it's statin' it pretty mildly. Makes me recollect the old days in the Forest Service when trails were mighty few and all mighty steep. It took honest-to-God men, then, with heavy packs on their backs, to travel the trails, and some wise hombre, God forgive him, thought it took mules, too. What did he do but suggest that the rangers make arrangements with the ranchers who raised mules to break the critters in payment for their use during the summer. He wrote that to the boss, several thousand miles away, and the boss wrote back, 'Fine idea.'

"Well, yours truly fell heir to five of these hybrids. The only good that ever came of the deal was that I raised my life insurance, and by some hook or crook I have managed to keep it paid up. When it comes to ocular demonstration of why a man should carry insurance, those mules had the most persistent insurance agent beat a city block. They could kick, bite, and strike all at the same time. With the assistance of James Johnston and John Loeffler, my two guards, we tied into the job of breaking them.

"Jim and I were supposed to be college breds when it came to knowing just how to handle mules *à la mode*, but when it came to the rough stuff John was there all-fours. He was built like a big tamarack stump and stout as a young bull. When the mules got to kicking up too many didoes to suit John, he would get an ear-hold, nose-hold, catch them by the front leg—any kind of a hold—and the air would be full of mule and John for a few minutes.

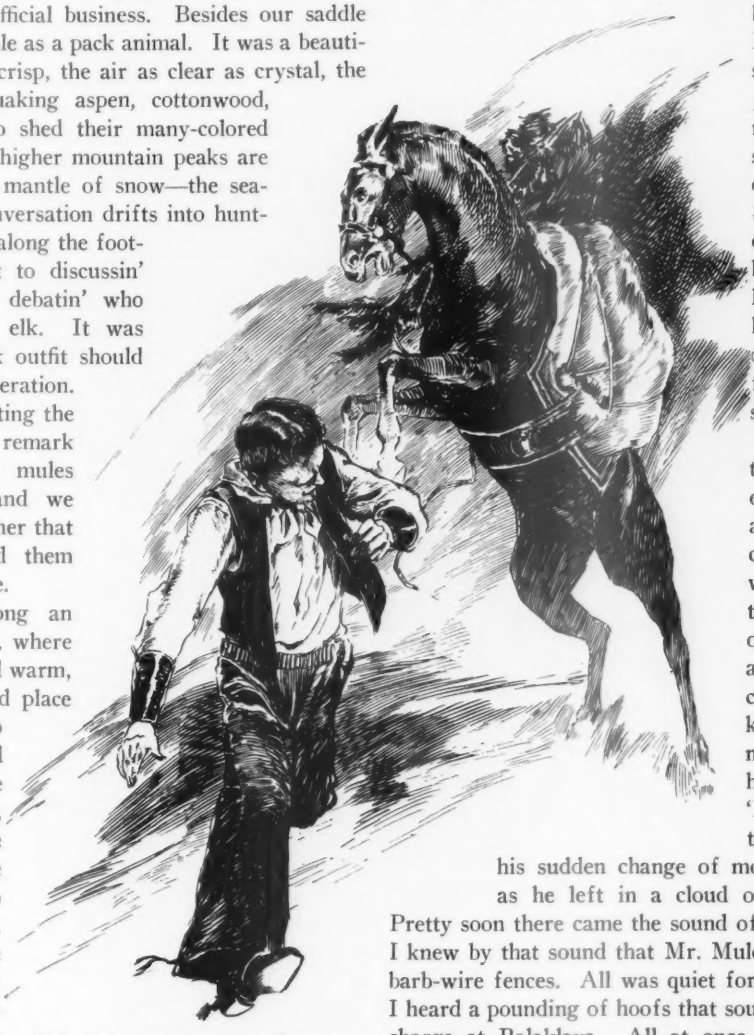
And when the dust and smoke had cleared away, John would be right side up, sitting on the mule's head, with a grin on his grimy face reaching from ear to ear.

"It was some time about the latter part of September—the last field trip of the season. Jim and I had to go over to Heart Butte on official business. Besides our saddle horse, each took a mule as a pack animal. It was a beautiful fall day, a little crisp, the air as clear as crystal, the season when the quaking aspen, cottonwood, and willows begin to shed their many-colored leaves and when the higher mountain peaks are covered with a light mantle of snow—the season of year when conversation drifts into hunting. So, as we rode along the foothills, Jim and I got to discussin' a hunting trip and debatin' who would get the first elk. It was natural that the pack outfit should enter into consideration. Forgiving and forgetting the past, Jim dared to remark that, after all, the mules were not so bad, and we congratulated each other that at any rate we had them broke good and gentle.

"As we rode along an open, grassy side hill, where the sun shone nice and warm, Jim thought it a good place to eat our lunch, so off we piled. Jim tied his saddle horse to the horn of my saddle, and we turned the horses and mules loose without unsaddling, to pick a bit as we ate.

"As long as I live I will never forget what took place a few minutes after we sat down to eat. One of those darn-fool mules took it into his head to go between the two horses, which were peacefully grazing. In the attempt Mr. Mule got the halter rope of Jim's horse fast on the forks of the pack-saddle, and then the fun began. That mule was determined to go between the horses. We watched the performance a minute or so, feeling satisfied that the horn of my saddle and the halter and halter rope were strong enough to resist him; but we failed to take everything into consideration. The cinch of my saddle broke. The second the saddle hit the ground he struck at it, then reached down and with his teeth tore off my slicker, tied behind the saddle.

"I was not long in deciding it was time to go to the rescue if I was to have any outfit left. No sooner did that mule see me than he came at me mouth open, striking at me every jump. In order to keep out of his way, I started running 'round and 'round my saddle horse. That crazy Scotchman Jim sat on the side hill and roared with laughter. I reckon it must have been a funny sight, but it was anything but funny for me. I was about all in, but not so with Mr. Mule, who was going strong. I hollered for Jim to come to the rescue. His only response was another outburst of laughter. Something had to be done; so, grabbing the horn of the saddle, I leaped astride Jim's horse. This put me out of danger, but the fun had only just started.



"He came at me, mouth open, striking at every jump"

"Mr. Mule decided to divest himself of everything in the pack and started across country like a scared wolf. These later tactics brought Jim out of hilarity most awfully sudden. He came rushing up, knife in hand, and cut my saddle loose from his horse, hollerin', 'Pile off.' I wanted to inquire the cause of his sudden change of mood, but all I heard, as he left in a cloud of dust was, 'Boots.' Pretty soon there came the sound of 'zing-zing-zing,' and I knew by that sound that Mr. Mule was no respecter of barb-wire fences. All was quiet for a few minutes; then I heard a pounding of hoofs that sounded like a miniature charge at Balaklava. All at once the brush along the creek opened up, and out shot the mule, with about 25 feet of lash rope, at the end of which a bed was whirling through the air like an airplane propeller. Right at his heels was Jim.

" 'Head him off,' yells Jim. I would have had a better chance to head off Halley's comet. The way that canvas was whirling through the air I expected to see the mule loop the loop and make a tail spin at the same time. It was my turn to laugh, and I did not overlook the opportunity. As Jim and the mule tore by, I hope the recording angel did not get what Jim said. It was intended for me and I got it all.

"By dint of hard riding, Jim finally got the mule rounded up between a fence and a slough. Working very carefully, he managed to get hold of the halter rope, remove the canvas from the trailing rope, and make further adjustments to the pack, so as to avoid any further

[*Continued on page* 108]

EDITORIAL

The McNary-Woodruff Bill

THE Association's bill, authorizing forty million dollars for eastern National Forests over a period of ten years, and introduced in both houses of Congress December 20, 1924, demands the aggressive and continuous support of the American people. They must make their support felt, if they mean business in going ahead with the policy which their representatives laid down in the Weeks Law of 1911 and reaffirmed in the Clarke-McNary Law of 1924. That is where the matter stands at present.

Representative Roy O. Woodruff, of Michigan, who introduced the measure in the House, comes from a state whose early prosperity resulted largely from its forest resources. The northern part of that state contains vast areas of land which have been subject to economic mistakes in the past. It may only be brought back through the vigorous action of an agency with enough strength and perseverance to co-operate with nature in correcting these mistakes. The bill which Mr. Woodruff has introduced will make it possible for the biggest agency in the Western Hemisphere to attack this job. That agency is the United States Government.

Senator Charles L. McNary, of Oregon, highly respected in the Senate for his knowledge of forestry, was chairman of the Senate Select Committee on Reforestation which last year recommended that not less than $3,000,000 should be the annual appropriation for purchase of National Forest lands. It is fitting that he should have introduced the measure in the Senate.

It must be shown when hearings on this important bill are held, that the establishment of a chain of eastern National Forests is the business of the hour. Much can be lost and nothing gained by delaying the passage of this important measure. The forest destiny of this nation need not be blackened by past mistakes if public inertia and consequent legislative indifference can be overcome. The American Forestry Association sees light ahead. Its members must make it their business to put their congressional representatives on record in favor of the measure.

A Message from an Engineer

A RECENT letter from Elwyn Mortimer Cooley, past president of the American Engineering Council, to James Hartness, newly elected president of the council, contains these paragraphs, which we are not foolish enough to tarnish by comment:

"It has been one of my ambitions to do something worth while in reforestation. I consider it the most vital factor in the future welfare of the country. Looking into the future no further than 75 or 100 years, I can see conditions arising, if our cut-over lands remain barren, which will make it very difficult, if not impossible, to live in this north temperate zone of ours—certainly not in the way we are now living.

"We are rushing at break-neck speed into a cul-de-sac, which, considering our education and supposed superior intelligence, is the greatest of all human tragedies. I am conscious this sounds dramatic. But I say to you that we of our day are living examples of the five foolish virgins. What shall we answer when called to account for our stewardship—not at the judgment day, but no farther ahead than the day of our children's children? I did not intend to say this. I wanted to make you realize my idea of the importance of doing something worth while in reforestation.

"The first great need is education. The message must be carried into the home—to the young and old. Not only must an appeal be made to emotion, but also—and far more important—to reason. The future without forests must be made so clear that each and every one will become himself an apostle to preach and do—do of his own accord without prodding."

Pennsylvania's Forest Bond Issue

THE State of Pennsylvania has proved that public ownership of forest land is a good investment. The resolution now before the state legislature to authorize an amendment to the state constitution permitting a forest bond issue of $25,000,000 should be passed. The proposed move is an important one, the first resolution having passed the assembly in 1923. After its required second passage by the 1925 assembly, it must then be submitted to the voters for approval. There has been plenty of time to weigh the matter carefully.

The Keystone State, through the inspiring leadership of men like Dr. Joseph T. Rothrock and Gifford Pinchot, has demonstrated its ability to manage forests as state property and has been sufficiently broad to pass enabling legislation which permitted the purchase and establishment of a National Forest within its boundaries, appreciating the influence of this forest on interstate flood problems. The state has its own forest academy, where a large number of men are trained for its service.

The sale of bonds is a common method of financing projects which benefit future generations. The purchase of forest lands equals the construction of highways as a public matter which may be properly financed by the issuance of bonds—in fact, it puts less of a burden on succeeding generations than do many other public activities which are financed through bond issue. The valuation of the tree crop will more than equal the bonded indebtedness. Instead of passing a burden to the future, the present generation will bequeath a revenue-producing heritage.

We believe that the people of Pennsylvania will approve this bond issue and will take the important forward step to redeem the devastated forest areas of the state, to insure prosperity to the industries, and to promote the welfare of Pennsylvania citizens.

Forests of Tropical America

WHEN the forests of the United States can no longer yield the tremendous quantities of wood required yearly to keep American industries going, where will they turn? Undoubtedly to the great unknown forests of tropical America. Ships that are now carrying lumber from our ports to the ports of Latin America will then have to reverse the long haul. It will mean more expensive lumber, of course, and it will be lumber from species with which our industries are not now familiar. No end of problems will arise in adapting our wood utilization and our wood-working machines to new woods.

That we will sooner or later have to draw upon the forests of tropical America to bridge the gap between forest consumption and forest growth in this country seems inevitable. It is none too soon for this country to begin a study of the properties of these tropical woods with special reference to their application to our wood-using needs. The forests of Latin America, it is estimated, cover more than one and a quarter billion acres. In the Amazon Basin and adjacent regions is the largest and most compact area of forests left in the world. Ignorance of the many species, the character of their woods, the extent of their location, is common to the United States and to the Latin-American countries themselves. That is one reason why millions of feet of lumber from the United States are shipped annually to countries south of us which are themselves rich in forest wealth.

One is apt to be staggered by the variety of species which compose these tropical forests. In the Amazon Basin, for example, some twenty-five hundred tree species are reported. The great number of species has indeed discouraged the utilization of these forests, because of a belief that a lumbering operation which has to concern itself, both in manufacture and marketing, with so many different woods would not be profitable. In the Philippines the same obstacle had to be overcome, but it was accomplished successfully. Surveys of the more accessible forests were made, a timber-testing laboratory was established, and knowledge as to the different woods was amassed. This knowledge, after a few years, turned the Philippines from a lumber-importing to a lumber-exporting country. Many Philippine woods considered useless in 1900 are today well received in the world's market.

In number of native tree species, the Philippines match the Amazon Basin, but investigation and research brought out that fifteen to twenty species constitute 80 per cent of the stand of merchantable timber—a number none too great to make lumbering operations commercially feasible. The same thing will possibly be found true of the forests of tropical America, where lumbering has not reached beyond trees of special value, such as mahogany, cedar, parana pine, and quebracho. The remaining trees, which possibly constitute 90 per cent or more of the stand in volume, are left as unmarketable because of lack of knowledge as to their value, quantity, quality, and acceptability.

It is gratifying to note that the Tropical Plant Research Foundation of the National Research Council is interesting itself in the development of forest research in tropical America, and that it has the active co-operation of the Pan-American Union. Active research to determine the possibilities of the principal tropical species should be going on in this country. The United States has the best Forest Products Laboratory in the world, and yet, because under the law it cannot spend money of its own appropriations outside the boundaries of the United States, its services are not available. We believe that Congress should provide the laboratory with a special fund of not less than fifty thousand dollars to begin a study of tropical woods, to the end that when we have to draw upon these forests we will have proper knowledge as to the woods best suited to our needs.

Wooden Overcoats

Being an Account of Thirty Centuries of the Use of Wood in Burial Cases

By R. K. Helphenstine, Jr.

CARE and reverence in laying away the dead is an age-old custom of the human race the world over. Conclusive proof of this is the discoveries made at the recently opened tomb of King Tutankhamen, where thirty centuries ago the royal remains of an apparently great and much-beloved monarch were consigned to their last resting place amid surroundings befitting his rank and station in life.

The manufacture of coffins dates back many centuries; the mummy cases of the ancient Egyptians, to be found in museums of the present day, are evidence of this fact. Cedar of Lebanon and oriental sycamore were two woods employed for this purpose at that time; and, strange as it may seem, some of these burial cases, although made only of wood, have survived the passage of centuries down the misty corridor of time, while the houses and other structures built of stone during those periods have crumbled into dust.

With a capital investment of approximately fifty million dollars and an annual pay-roll of one-third of this amount, the manufacture of caskets and coffins in this country is today an industry of no small importance.

Burial cases are made of a variety of materials, including wood, bronze, glass, and lead, the latter being employed mainly for hermetically sealed cases, in which bodies are placed for distant shipment, or where the lapse of time, because of inclement weather or other reasons, between death and interment is in excess of the customary period of two or three days. Bronze burial cases are, no doubt, the most expensive of the various types manufactured, frequently costing several thousands of dollars. The glass cases, which are usually of the crystal variety and of more recent manufacture, are also sufficiently high in price to preclude their purchase by the family of average means. In this country, as well as in most other countries, wood is the material most commonly used in the manufacture of caskets and coffins, and it is this important product of the forest with which this article has to deal.

At one time in the history of this country it was the custom for every community to provide its own coffins as needed, and the local carpenter or cabinet-maker was called upon to furnish them. Ordinarily, no advance preparation was made to meet the demand, other than the laying aside of a few suitable boards for this purpose.

THE ANCIENT MUMMY CASE OF EGYPT

This is a typical example. To the left is the case, and to the right the cover. Note the laminated construction and dowels.

THE ULTRA MODERN BURIAL CASE

A handsome casket of solid bronze that retails around $2,000. In a case of this type the body of President McKinley was laid to rest.

In certain sections of the country, principally in remote rural districts, this practice is still followed. With a steady annual increase in population, however, and a correspondingly higher mortality rate, the manufacture of burial cases has become an industry. Hence, at the present time, these very essential commodities are for the most part factory-made in cities or large towns, from which they are shipped to factory branches for distribution as required, or direct to undertaking establishments.

The name "coffin" has in this country been almost universally replaced by the term "casket." Both are used for the same purpose, the only difference being that the coffin is constructed so as to conform to the lines of the human body, while the casket is merely rectangular in shape. In the United States the latter type of burial case is the one most commonly used at present, while in many foreign countries the coffin-shaped case is more generally employed.

The annual consumption of wood in the casket and coffin industry in the United States is close to 160 million feet, board measure, representing 29 different woods. Included among the woods used are both cheap and high-priced domestic varieties and the more costly imported species. The manufacture of outer cases, or the rough box in which the casket is placed, is also a part of the industry. As much wood is consumed in making these boxes as is used in the manufacture of the burial cases themselves.

Woods that are durable in contact with the ground, easily worked, possess the ability to take stain well, and are susceptible of a high polish in the finishing process are the ones usually employed for coffins. These properties are all common in a high degree to both eastern red cedar and black walnut, and both have long been favorites for this use. Because of the present scarcity of these two species and their correspondingly high price, the former has been practically eliminated from the list of woods used for coffins by the industry and the latter is employed only for the better grades. For cheaper coffins yellow poplar, which, though less durable, possesses the other properties requisite, is extensively utilized. In the South the principal wood used for coffins is cypress, while California redwood and western red cedar serve the same purpose on the Pacific coast, and basswood and red gum are favored in the Mississippi Valley and Lake States regions.

Chestnut is considered the most suitable wood for caskets. Since nearly all of the less expensive caskets are cloth-covered, this permits of the use of the lower grades of lumber. At the same time the raw material used must be free of defects that would be likely to affect the strength and durability of the casket. Chestnut is especially durable under ground, as evidenced by the fact that disinterments after 30 years have been made and the chestnut casket was found sufficiently sound for reburial. In addition to its durability, the wood of chestnut is light in weight and of sufficient strength. Some of the chestnut employed in the manufacture of caskets is of unusually high quality, but for the most part the grade known commercially as "sound wormy" is used. The lumber sold under this grade is perforated with numerous worm holes about one-sixteenth of an inch in diameter, but is otherwise sound and possesses the required strength and durability. From the standpoint of manufacture, the worm holes in this grade of chestnut lumber are really an advantage, in that they afford good anchorage for the glue in applying the cloth covering.

The high-priced wooden caskets are usually made of beautifully figured cabinet woods and are not cloth-covered.

CASKETS IN THE MAKING

***Upper*—The lumber stock room of a large case manufacturer. The sides, bottoms, tops, ends, etc., are shown cut to size and ready for assembly.**

***Middle*—The paint and varnish department, where high-grade cases are undergoing finishing. These are being finished in the natural wood.**

***Lower*—Adding the carved corner blocks, molding, and other ornamental parts in the process of manufacture.**

Often they are handsomely carved and otherwise embellished with fancy moldings, after which they pass through an elaborate process of staining, filling, shellacking, varnishing, and rubbing to give them a finish comparable to that of a piano case. Of the domestic woods used for these high-grade caskets the most important are burl-cut black walnut, full quarter-sawed white oak, and figured red gum. Among the imported woods employed are satinwood, Circassian walnut, and mahogany. As much care is given to the interior trimming of these costly burial cases as is devoted to their exterior finish. Usually they are lined with heavy brocaded silk or satin and are beautifully tufted throughout.

The woods used for outer cases, frequently called rough boxes, are often of the same wood as is used in constructing the casket, but ordinarily of a lower grade and without finish of any kind, other than the mere surfacing of the boards prior to putting the box together. For the most part those woods that are commonly employed in the manufacture of packing and other types of boxes for the shipment of various articles of commerce are the ones used for outer cases. These include most of the white and yellow pines, hemlocks, firs, cedars, redwood, cypress, Douglas fir, and many of the softer-textured hardwoods, such as cottonwood, basswood, and yellow poplar. These outer cases are usually more strongly and carefully made than the ordinary packing box, and for this reason present a much neater appearance. Frequently they are used as shipping cases to protect the coffin or casket in transit, and at their destination serve as the rough boxes to receive the burial case when it is lowered into the grave.

. . . . . .

Perhaps few of us want to think of the "wooden overcoat" which will finally shield our tired bodies when we are laid away, and yet how fine a thing it is to know that the heart of a tree we loved in life may be our house in this step toward immortality.

Timber Harvest and Scenic Beauty

[*Continued from page 73*]

timber which I have been discussing. And even in these cases the foresighted landscape designer will see that young trees are started to take the place of the veterans when they finally become so aged that it is better to cut them than to permit them to remain as a ragged, worn-out bit of scenic beauty.

The direction of cutting in the larger scenic landscapes cannot be left solely in the hands of a technical forester; nor is it exclusively the work of a landscape architect. The forester should have charge of the timber harvest, but a landscape architect should be consulted if the finest effects are to be secured.

There is ample proof that timber harvest does not harm landscapes where forests are big elements in the vistas. In the Washakie National Forest there is a timber company which is observing the regulations of the Forest Service to the last letter, not only because of Service rules, but for its own protection. It is timber-farming a great watershed. The rotation is forty years. Lands they cut over now will be cut again in forty years, in eighty years, and again in a hundred and twenty years. At present not quite half of the standing timber is cut. This includes all of the overmature timber and some of the mature timber. But that which is left standing will fill out in the next forty years and give a greater harvest at that time than now. The stand is lodge-pole pine, and the cutting of the old trees will give young trees an opportunity to grow.

Today the areas which have been cut over can be differentiated from wholly uncut stands, when viewed from a distance, only by the closest comparison. When one walks in the timber he is conscious that cutting has gone on, but he feels little or no loss. There are enough trees left to give all of the effect found in some virgin forests. I venture to say that if one of the superradicals in conservation were to be set down in the midst of this timber which has had one cutting taken from it, and at a point where he could not see a freshly cut stump, he would declare that it was an untouched bit of Rocky Mountain forest. The cutting on the Washakie is only one of hundreds in the forests.

It seems unnecessary to differentiate between the slashing, wanton destruction of timber which characterizes some lumber operations. This wasteful slashing of forests utterly devastates scenic beauty. But timber removal done sanely, following good forestry practices, causes very little permanent harm to intimate forest landscapes and practically no harm whatever to the greater scenes. For a few years there may be slight scars. Young forests soon erase them. Then for a cycle of twoscore or more years we enjoy the growing trees. Then come the short years of harvest, followed by the quick years of recovery. Then again we are ready to revel in the strong young trees for another forty to a hundred years.

Timber harvest under the right sort of direction *not only secures the further service of the old tree to humanity by turning it into lumber before it falls and rots, but it is a genuine benefit to the scenic beauty when a part of that beauty is created by expansive green forests.*

Heretofore timber harvest, as an asset to scenic beauty, has not been considered. We have thrown up our hands when it was proposed. But, in spite of the fanatics who would not cut a twig, I am convinced by thorough first-hand investigation that lovers of the outdoors will soon recognize the fact that the scenic beauty of extensive forests is improved by timber harvesting.

Grantland Forest

Dixieland's First Pine-Planted Woods

By W. R. Mattoon

Photographs by the Author

ON A recent trip through the South, I chanced to visit a small forest near Griffin, the seat of Spalding County, Georgia. It was a delightful bit of pine woods, covering, perhaps, ten acres, its young trees tall and straight and its floor brown and fragrant with fallen pine needles. Having spent much time in the piney woods of the South, I became immediately aware that in this little colony of trees there was an atmosphere which I had felt nowhere else in the Southern woods. I became suddenly alert. What was the explanation? Fire? That was it. I missed the familiar signs of forest fire. So far as the eye could observe, the red enemy of the "piney woods" had never wounded the trees or impoverished the soil. The little forest fairly radiated the vigor of growth and the health of nature.

But that was not all. In the South, planted forests thirty or forty years old are not found; but in this case the hand of man had surely worked here years ago. Nature, in its most orderly mood, could never have planted trees in such uniform rows. Unknown and unheralded even in its own land, here, indeed, was probably the oldest pine planted forest of any size south of the Mason-Dixon Line. The stand consisted of about 7,000 hill short-leaf pines (*Pinus echinata*) and a few loblollies (*P. taeda*). The trees ranged from 45 to 60 feet in height and 9 to 12 inches in diameter at breast height, some standing 70 feet high, with a girth 15 inches across. They were variously spaced, mostly from 8 to 10 feet apart, and in clearly defined rows following the contours.

The stand is fully stocked with trees, which makes the canopy strikingly complete. It is estimated roughly to contain 18,000 board feet of saw timber to the acre. A full blanket of pine straw and litter protects the soil and conserves the moisture in times of drought. As a result, the growth is vigorous. The tract, which lies between the big Atlanta-Macon Highway, leading southeast from Griffin and Oak Hill Cemetery, covers the two gentle slopes flanking a depression in which flows a wet-weather

THE SOLDIERLY TREES, ROW ON ROW, IN THE GRANTLAND TRACT, WHICH IS BELIEVED TO BE THE FIRST MAN-PLANTED FOREST IN THE SOUTHLAND. AS WELL AS BEING OF GREAT ECONOMIC VALUE AND INSPIRATION, THE STAND IS STRIKINGLY BEAUTIFUL

stream. The surface shows old gullies, and clearly the land was formerly in cultivation.

Curiosity and a little search on the writer's part easily brought to light the history of this rare bit of Southern forest. Information was very kindly furnished by the present owner, Mrs. Leila Grantland Barnes, of Griffin, who resides in a beautiful home across the highway. The forest was planted by her father, Seaton Grantland, in 1892, which would make it now about thirty-three years old. It is, therefore, probably the first forest in America to be hand-planted with any of the Southern pines.

IN THE GRANTLAND TRACT A CABIN HAS BEEN BUILT, MADE OF TREES CUT IN THINNING AND IMPROVING THE FOREST, AND IT SERVES AS A FAVORITE PLAY SPOT FOR THE CHILDREN OF THE TOWN

In spite of certain pessimistic neighbors, who declared that the thing could never be done and was ridiculous, Seaton Grantland made a complete success of planting small pines. The trees are said to have been about one foot in height at the time of planting, which would make them about two years old. In the belief that it was either advisable or necessary, the little trees, before being dug, were marked or tagged in such a manner as made it possible to set each in the same position, with reference to the points of the compass, as that in which it had grown. The plantation, it appears, was kept cultivated during the first two years or so. The factors which led to this pioneer planting are said to have been the washing of the soil and the desire of the family to cut off the view of the cemetery, which was beginning to make a too conspicuous showing on the opposite hill.

The founder of this forest, for which the writer proposes the name of Grantland Forest, was born on November 16, 1847, at Milledgeville, the original capital of Georgia. His father, David J. Bailey, and his mother, Susan Mary Grantland, were descended from Virginians who came to Georgia back in the "seventeen hundreds." Graduating from the Virginia Military Institute, he later served in the Confederate army, and was in command of the Guard of Honor at the burial of General Lee at Lexington, Virginia. At the age of 21 years, Seaton Grantland Bailey dropped his surname at the request of his maternal grandfather.

On a tablet in Oak Hill Cemetery marking the last resting place of this early forester and founder of the Grantland Forest is found the following inscription, said to express very fittingly the spirit and life of the deceased:

"Lord who shall dwell in Thy tabernacle; or who shall rest on Thy holy hill? Even he that leadeth an uncorrupt life, and doeth the thing which is right and speaketh the truth from his heart."

Mrs. Barnes has protected the forest zealously against fire and vandalism and it is her intention, as soon as public sentiment becomes so well developed that she is assured of the trees being properly cared for, of putting the property into public ownership as a town forest and memorial to her father.

The Annual Meeting

AT THE time this issue goes to press the annual meeting of The American Forestry Association, held at the Hamilton Club, in Chicago, on January 22, with the Illinois Forestry Association, the Union League Club, and the Hamilton Club as hosts, is in progress. While it is impossible to report the meeting in this issue of the magazine, the scheduled program and procedure are as follows: A morning session, to be held at 10 o'clock, at which the meeting will be opened by an address by Henry C. Cowles, President of the Illinois Forestry Association. The purpose of this morning meeting is to stimulate interest in forestry in the State of Illinois and surrounding territory. An afternoon session following, at 2 o'clock, the objective of which is to set in motion a concerted effort to develop maximum co-operation in forest-fire protection under the Clarke-McNary Act. At the banquet, which is to be held in the evening, at the Hamilton Club, the discussion will be devoted to the subject "National Forests for the Middle West." The meeting will be fully reported in the March issue of the magazine.

Plan for Eastern National Forests Gains Strength

"THE American Forestry Association has tackled a big job, but one that must be done," says the *Hartford* (Connecticut) *Courant* in commenting on the Association's program, which calls for a fiscal policy authorizing appropriations of $40,000,000 for National Forest purchases over a period of ten years.

The movement has provoked wide editorial comment throughout the country, of which the following from the *Columbus* (Ohio) *Evening Dispatch* is typical: "This is not merely a policy of enlightened progress, but it is the only rational answer to a call of profound economic necessity, growing out of the rapid decline in our reserve supply of the raw timber material for all kinds of wood products."

A number of members of Congress have shown great interest in the legislation suggested and on December 20, the last day before the Christmas recess, Congressman Roy O. Woodruff, of Michigan, introduced the bill, which is here printed in full as H. R. 11034. Simultaneously Senator Charles L. McNary, of Oregon, introduced the same bill, which was designated S. 3736.

68TH CONGRESS
2D SESSION

H. R. 11034

IN THE HOUSE OF REPRESENTATIVES

DECEMBER 20, 1924

Mr. WOODRUFF introduced the following bill; which was referred to the Committee on Agriculture and ordered to be printed

A BILL

Authorizing an appropriation to be expended under the provisions of section 7 of the Act of March 1, 1911, entitled "An Act to enable any State to co-operate with any other State or States, or with the United States, for the protection of the watersheds of navigable streams, and to appoint a commission for the acquisition of lands for the purpose of conserving the navigability of navigable rivers" as amended

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there is hereby authorized to be appropriated, out of any moneys in the United States Treasury not otherwise appropriated, to be expended under the provisions of section 7 of the Act of March 1, 1911 (Thirty-sixth Statutes at Large, page 961), as amended by the Acts of March 4, 1913 (Thirty-seventh Statutes at Large, page 828); June 30, 1914 (Thirty-eighth Statutes at Large, page 441); and the Act of June 7, 1924 (Public Numbered 270); $3,000,000, available July 1, 1926; $3,000,000, available July 1, 1927; $3,000,000, available July 1, 1928; $3,000,000, available July 1, 1929; $3,000,000, available July 1, 1930; $5,000,000, available July 1, 1931; $5,000,000, available July 1, 1932; $5,000,000, available July 1, 1933; $5,000,000, available July 1, 1934; $5,000,000, available July 1, 1935; in all, for this period, $40,000,000, to be available until expended.

(The same bill was introduced December 20 in the Senate as S. 3736 by Senator Charles L. McNary. It was read twice and referred to the Committee on Agriculture and Forestry.)

The measure was referred to the Committee on Agriculture in the House and to the Committee on Agriculture and Forestry in the Senate.

One of the most encouraging developments so far in the effort of the American Forestry Association to put this program before the people of the country has been the receipt of inquiries from states concerning enabling legislation necessary to authorize the purchase of National Forest lands by the government within the states concerned.

Another encouraging development has been the request on the part of a large number of associations for further information, so that the program might be carefully studied and intelligently endorsed.

In more than one instance organizations have been anxious to know what individual action they could take and many of the strong national bodies have appointed committees to consider their forestry activities. The most cordial relations have been established with these committees.

Now that the bill is identified as S. 3736 and H. R. 11034, it becomes the duty of every member of the American Forestry Association and every friend of the conservation movement to write his Congressman and Senator in support of the bill. Even though it has not yet been reported out of committee, your Congressman will want to have your view. It has been the experience of the American Forestry Association that the men who make our laws are glad to secure dependable information on measures which come before them and to know how their constituents look at these measures. Please do not put this off. Sit down today and write your Congressman and your Senator.

A list is given here of the associations which have endorsed the legislative program of the American Forestry Association for National Forests in the eastern half of the United States.

ORGANIZATIONS ENDORSING THE PROGRAM

American Game Protective and Propagation Association, Woolworth Building, 233 Broadway, New York City.
Appalachian Mountain Club, 5 Joy Street, Boston, Mass.
The Barre Chamber of Commerce, Barre, Vermont.

Delaware State Federation of Women's Clubs, 2401 Boulevard, Wilmington, Del.
The Hickory Handle Association, Heber Springs, Arkansas.
Lake Placid Club, Essex County, New York.
National Association of Wood Turners, Incorporated, 412 Citizens' Bank Building, South Bend, Indiana.
National Conference State Parks, 4142 Interior Building, Washington, D. C.
National Council of Furniture Associations, Grand Rapids Savings Bank Buildings, Grand Rapids, Mich.
The National Grange, Office of Master, 970 College Avenue, Columbus, Ohio.
Permanent Wild Life Protection Fund, New York Zoological Park, New York City.
Empire State Forest Products Association, Room 316, Journal Building, Albany, New York.
South Bend Chamber of Commerce, Chamber of Commerce Building, South Bend, Indiana.
St. Louis Chamber of Commerce, St. Louis, Missouri.
Superior National Forest Recreation Association, 301 Shaw Street, Rockford, Illinois.
Selma Chamber of Commerce, Selma, Alabama.
Society of American Foresters, Washington, D. C.
Society for Protection of New Hampshire Forests, 4 Joy Street, Boston, Massachusetts.
Western North Carolina, Incorporated, Asheville, North Carolina.
Furniture Manufacturers of Evansville, Evansville, Indiana.
Camp Fire Club of America, 38 Park Row, New York City
National Parks Association, Wilkins Building, Washington, D. C.

Chief Forester Urges Necessary Federal Action in Annual Report

THE establishment of a definite program and fiscal policy for the extension of National Forests by purchase and a concerted drive for the elimination of waste in the manufacture and consumption of timber are listed by Chief Forester William B. Greeley in his annual report as the necessary things for which immediate provision should be made by the Federal Government.

The Forester's report, which was released just before Christmas, cites the passage of the Clarke-McNary forestry law as the most important forward step of the year and briefly outlines the provisions of this law.

Consideration of the 406,000,000 acres of privately owned forest land, which previously has hardly been included in a national forest policy and from which it is stated that 80 per cent of our total forest products must come in the long run, is pointed out as a matter of great importance.

Receipts from the 147 National Forests during the past fiscal year are reported as $5,250,000. Expenditures for general administration and protection totaled $5,064,000. Two million dollars of this money was used in fire prevention and suppression.

At the close of the fiscal year covered by the report the Forest Service had 157,502,793 acres under its jurisdiction. This represented an increase of 265,986 acres during the year. One new National Forest, the Allegheny, in northern Pennsylvania, was established during the year.

The report calls attention to the fact that in the unreserved public domain at the present time there are about 10,000,000 acres of forest land, or land chiefly suited for timber crops, which should be included in the National Forest system. In the matter of military reservations, arrangements have already been made to place such areas under the Forest Service for timber management purposes without interfering with military uses.

Under the authority of the Weeks Law, 228,004 acres were acquired during the year, at an average cost of $3.68 per acre, thus bringing the total acreage actually acquired since 1911 for National Forests, in the East and South, up to 2,123,150 acres.

During the fiscal year construction work on 1,857 miles of roads and 4,805 miles of trails was completed in and adjacent to the National Forests. The maintenance work covered 742 miles of highway and 31,846 miles of trail.

In sharp contrast with the preceding year, the fire season of 1924 has been one of the most critical in the history of the Forest Service, according to the Forester. Long-continued drought in the Pacific Coast regions made the 1924 season especially bad in California. In view of the hazardous conditions which existed in nearly all regions, fire losses were kept surprisingly low in all States except California. Complete figures for 1924 are not yet compiled, but up to September 30 a total of 7,279 fires inside of the National Forests only had been reported and over 500,000 acres of Federal land had been swept by flames.

Other features of the report are a statement of a substantial increase in timber sales, a review of the interference of foot-and-mouth disease with the grazing of live stock on National Forest Ranges, a review of progress in research work in forestry, and of recreation development and needed funds for this purpose in National Forests. The number of persons who visited the National Forest areas in 1923 is estimated at 10,500,000. This represents an increase of 8,000,000 visitors since 1917.

Yucca Trees of the Mojave Desert

By Bertha E. McLaughlin

REAMS could be written about the alluring fascination of the desert; of the coyote, the little gray sprite, or gnome, of the sands, so forlorn and desolate-looking that he wins interest and sympathy until, on closer acquaintance, one learns more about him—of his abject cowardice, so incarnate that when he *does* gather up courage to show his teeth in a snarl the rest of his face registers apology for his having done so.

Stories could be told of the rattlesnakes and the sidewinders, the kangaroo mice, and other little, silent people of the desert nights; of the woodpeckers and the humming birds and the mocker that sings in the moonlight. But this article is to be confined to the grotesque and interesting Yucca trees.

The *Yucca Whipplei,* or Spanish bayonet, called by the Spanish, "The Candlestick of the Lord," in the spring and early summer is found in countless thousands, marching in semi-orderly array up and down and in and out among the California foothills, like the advance guard of some strange floral kingdom.

The Yucca trees of the smaller pictures are found principally on the Mojave Desert near Victorville, California. Four trees, each of a different age and in a different stage of development, are shown in the picture. The first is of a mere stripling—known to be such because it has no branches. No Yucca begins to branch out until it first blossoms; but because it is called a stripling do not get the idea that it is necessarily young, for it may already be thirty or forty years old. The flowers and buds usually remain on the stalk for three or four years before they fall, and from one of the remaining buds springs the first upright branch, from which in time come forth myriad other branches, spreading in many fantastic shapes and directions. The second shows two trees probably around fifty and one hundred and fifty years of age, judging by their different stages of development, and the third shows what is known throughout the Mojave Desert region as the patriarch of all the Yucca tribe, estimated to be three hundred or more years of age.

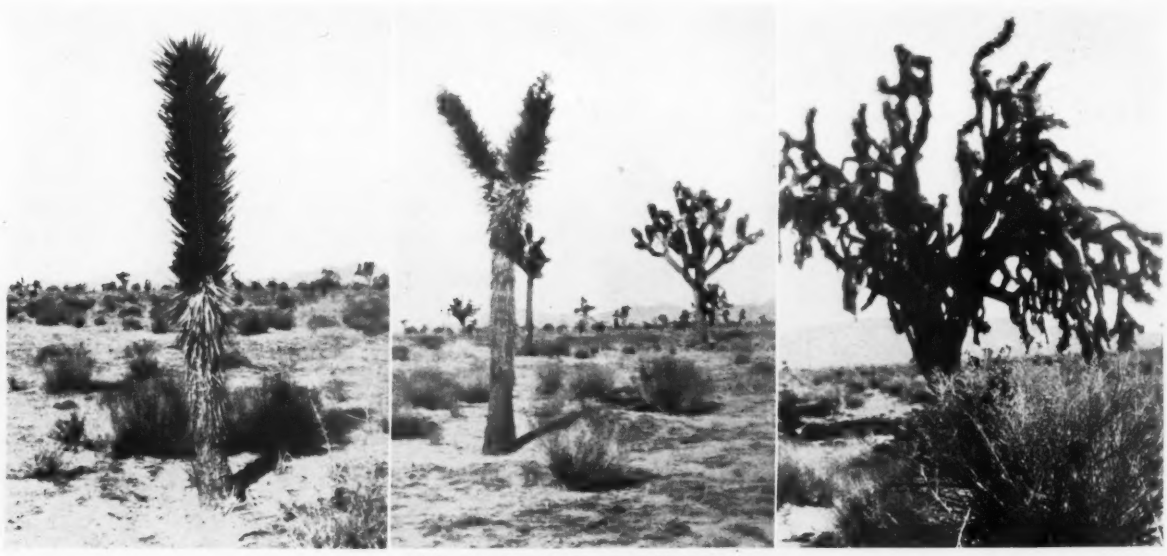
A FOOTHILL BLOOMER—*YUCCA WHIPPLEI,* OR SPANISH BAYONET, PICTURESQUELY CALLED BY THE SPANISH "THE CANDLESTICK OF THE LORD"

Some sixty-odd years ago a bunch of young surveyors working their way across the desert blazed this particular tree clear around the trunk just where it met the earth, and they chose it because even then it was the tallest and huskiest of any in that location.

Just a few years ago one of those lads, now an old, old man, found himself in Victorville on business, and out of curiosity drove out to see the old monarch. Much to his amazement he found that in all those sixty years the tree had grown *upward* less than *one inch.* Of course, it had continued to branch out, and old age had caused part of it to split and fall away from the main tree, and the fallen part had become so ground down and polished by the fierce sand and wind storms of the desert that it was as hard as coal, though gray, of course, instead of black.

All about the desert bits of this hard or semipetrified wood are found and used for fuel. The wood will surprise you, for it is so nice and dry that you say, "My! What a glorious fire this will make in the fireplace!" and you pick up an armful and carry it into the house with you, get paper and kindling, and proceed to lay a perfectly scientifically arranged fire—strike your match, touch it to the paper, draw up the old armchair, and prepare to enjoy a warm, cozy evening. And right merrily it catches and up leap the flames; but with almost a flash the wood is all consumed and nothing is left but a tiny handful of smoking gray, powdery ashes and darkness, where you had anticipated a bright, blazing, cheery fire, to last an hour or more.

But this same spongy, tough, fibrous wood has many



THE LIFE STORY OF THE YUCCA

The first a mere sapling, though it may be forty years old. The second shows two youngsters of perhaps fifty and one hundred and fifty years of age, and the third the "grandpapa" of the Yucca tribe, estimated to be three hundred or more years old.

other uses. Originally the Indians utilized nearly every part of it to make ropes, baskets, saddle blankets, mats, and many other things, even pounding the bulblike root into a pulp and using it for soap. However, its greatest commercial value is found in its use in the manufacture of artificial limbs and surgical splints, especially the latter, for when it is soaked in water and bound to an arm or leg it conforms to the part and, being porous, admits a circulation of air that is very beneficial. And so this unique desert plant proves of decided practical value.

Mule Days!

[*Continued from page 97*]

stampede. As he approached me I greeted him with one of those grins that can penetrate the hide of a pachyderm. In return he gave me the bad eye, which said: 'Nothing to laugh about—a man losing a pair of seven-dollar boots. And a Scotchman at that!'

"Without any further parley, we got under way. We rode along all the afternoon, made camp that evening, and never a word was spoken. Supper over, we each sat on a pack box, watching each other out of the corners of our eyes. The only noise was the roar of the near-by creek, as it dashed its way through the rocky gorge. The proverbial coyote was not on the hill calling to his mate, neither was a bull elk bugling from the distant timbered basin. In fact, there was none of that old, bewhiskered sentiment that is so dear to the tenderfoot around that evening.

"Well, as I was saying, we were eyeing each other, both wishing something would happen to break the strain. Did it happen? I'll tell the world it did. All at once there was a rent in the atmosphere. Did you ever see a rent in the atmosphere? Before you could bat your eye, Jim's pet mule began tearing hell up by the roots and scattering it around the landscape in chunks. He bucked and bawled, turned double-hoof springs in the air, and several other didoes too quick for the eye to perceive. I am one of those guys who laughs at any old thing; consequently being knocked four ways at once did not greatly disturb my innards. But poor Jim! I had to pour water on him to bring him to.

"When we'd cleared the air of stars, we decided to investigate the cause of that mule's brainstorm. It wasn't hard to fathom. It appeared that, after satisfying his hunger, Jim's mule decided to take a little siesta in the shelter of the near-by willows, and very unintentionally had straddled a hornets' nest suspended on a willow branch. The hornets lost no time in coming out and startin' a hurry-up game of stingeree. If that mule's actions were any criterion, I'll say the Birch Creek hornets won the world series in a jump away.

Though Jim has now gone to that land from whence no traveler returns, in my memory I can still see him that evening making up his bed and singing, in his clear tenor voice:

"'Don't be ashamed you are a ranger or bear a ranger's name;
They have gone down in history's pages and in the hall of fame;
They can make the trails and ride them, too, and a devil of a thing they cannot do,
So don't be ashamed you're a ranger or bear a ranger's name.'"

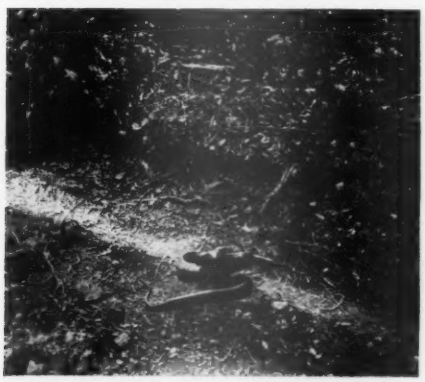
Do Snakes Climb Trees?

By Lewis E. Theiss

MY FRIEND, Raymond B. Winter, District Forester in charge of the Bald Eagle Forest, in Pennsylvania, was driving along one of his wood roads on Spring Mountain when he came across a blacksnake stretched out in the way. He passed over the snake, not touching it with his tires, and stopped as quickly as he could to look back. The noise of the car passing overhead had roused the snake. It had coiled in defensive formation. Forester Winter jumped from his car with his camera and snapped the coiled snake. Then he poked it with a stick and made it angry, taking another picture of it in a belligerent attitude.

THE BLACKSNAKE WAS LYING IN THE ROAD WHEN MR. WINTER FIRST NOTICED IT

Further prodding caused the snake to flee; but it fled straightway up the brush or saplings, which here grew dense, to a height of fully fifteen feet. Four times Mr. Winter snapped the snake as it traveled up the brush. He shot out his film before the snake got to the top, and so could not get a picture of the reptile in the sapling tops. There the snake seemed to know it was out of danger, for it rested quietly in a horizontal attitude. It was fully fifteen feet in air. After watching the snake for a time, the forester drove off.



AFTER TAKING ITS PICTURE, HE STIRRED IT UP WITH A STICK AND THEN GOT ANOTHER SNAPSHOT

Upon another occasion he had cause to explore a hole in a tree. The hole looked like a squirrel hole or an owl's refuge. Something was evidently in it, and the forester set out to learn what it was. The hole was fully twenty-five feet above ground, in a tree at least eighteen inches in diameter at the butt. Going up the tree, the forester thrust his hand into the hole and was surprised to draw out a big blacksnake.

AFTER WHICH THE SNAKE IMMEDIATELY "TOOK TO THE TALL TIMBER"—IN THIS CASE THE NEAREST SAPLINGS

He thinks snakes go up trees that are crooked or with an inclination without difficulty, just as they get over brush. He also says the mountaineers say a rattler will go straight up a vertical tree, but he has never seen one do it. It does not appear to me to be a possibility. Sometimes these old mountaineers are right when the scientists are incorrect, but they are also full of nonsense, which they believe.

I personally have seen water snakes lying out on low bushes that overhung the water. I cannot think they were watching for prey, with intent to drop on it, yet I have seen them day after day return to the same place. Likely it was a good sunning spot.

APPARENTLY STILL FEARFUL OF PROXIMITY TO THE GROUND, IT CLIMBED STILL HIGHER

AND WAS GOING ON UP WHEN THE FILMS IN THE LITTLE CAMERA HAD NEARLY EXHAUSTED

THE LAST "SNAP" SHOWED THE SNAKE QUIETLY RESTING IN A HORIZONTAL POSITION, FULLY FIFTEEN FEET ABOVE THE GROUND

Charles Howard Shinn

APRIL 29, 1852 — DECEMBER 2, 1924

ON TUESDAY night, December 2, at his daughter's home in Ukiah, the great soul of Charles Howard Shinn passed on. What his passing means to the California District of the Forest Service, and to all foresters and the cause of forestry in our country, words only haltingly express. Truly, one of his associates has said, his world can never lose him. Other men may serve the cause of forestry in positions of more far-flung responsibility, but few more significantly, and none ever more truly, to his last ounce of energy and life. And to none, we venture, is it given to contribute to his fellows in larger measure of those most priceless possessions of men or organizations, the invisible and eternal foundations of character — service and love. From Peace Cabin has flowed unceasingly fine inspiration, high-mindedness, courage, and the will to do.

CHARLES HOWARD SHINN

For over fifty years Mr. Shinn was intimately associated with and actively interested in the forest work of our country. In this field there is no name better known or loved than his.

An Appreciation

BY WALLACE HUTCHINSON

AFTER seventy-odd years of happy life, Charles Howard Shinn has crossed the Great Divide.

Never again will he look with misty eyes upon the snow-capped peaks and quiet valleys, the forests, the birds, and the flowers he loved so well.

"Peace Cabin" will know him no more, and the kindly cedar at the door, whose sprays of evergreen carried a message of hope and cheer to countless thousands throughout the world, will never again bow to his gentle touch.

But the message of the forests and the great outdoors that flowed from his magic pen has traveled far afield. To quiet hamlets and busy cities it has carried the breath of the mountains and an inspired plea for the preservation of those wonders which God hath wrought.

His name will ever be emblazoned on the Honor Roll of those who have fought a good fight that our children and our children's children may know something of the unspoiled beauties of forests and hills.

And we, his friends, how we shall miss him! Miss his kindly spirit, his love for all things great and small, and that beauty of life and character that made him a man among men.

This old world would be a hard world indeed to live in were it not for the friendship, and love, and inspiration of such men as Charles Howard Shinn.

Fences

[*Continued from page* 83]

the property line cannot be made of it unless an agreement exists between the adjacent owners. On the other hand, smooth wire is of little value in turning cattle unless well braced with stays. Fence-builders consider first the purpose, and second the material and cost. The New England farmer uses stones left on the land at the time of the last ice invasion. His mountain neighbor to the Southwest uses his timber freely in "snake" fences. The plainsman of the West uses the wire; his posts alone are a heavy item to him, not to mention an all-wood fence. The stockman of the Southwest has very few nice, straight sticks to use, so he does his best with what he has and sets his mesquite corral posts on end. European immigrants cut roadside brush and interweave the pieces to make a chicken-proof fence around the garden patch. The pictures complete the story. The fence is here to stay.

(The photograph used in the heading cut is taken on the estate of Mr. Julius Fleischmann, and is used by the courtesy of Hartmann-Sanders Company.)

The Story of a Southern Magnolia

A NUMBER of years ago, in Southern Georgia, a large evergreen magnolia seemed to be gradually dying. At least one-third of the smaller branches were leafless and dead. The leaves that remained were curled under at the edges and more yellow than green. The owner of this tree valued it very highly, as it occupied a most important position near the house, and we were asked to prescribe.

A careful inspection disclosed no serious injury by insects or fungous diseases, but examination proved that the roots were not able to obtain the water and food materials they needed from the surrounding soil. Arrangements were made to supply these elements by digging up the earth around the tree and laying a line of tile to carry water to the roots. This was supplemented by mixing well-rotted manure and other fertilizers with the soil, which was then replaced. All deadwood was pruned out and some small live branches cut out to stimulate new growth.

This tree received no other treatment except thorough watering through the tile during the dry weather. At the end of two years it had largely regained its vigor. Its leaves were deep green and new growth was developing on all its branches. Today its vitality seems completely restored and its beauty is increasing rapidly.

Now we are nursing a number of magnolias back to health. All are responding in the same satisfactory manner. Our success with this tree naturally resulted in a demand for similar services on neighboring estates. And on numbers of beautiful northern estates we are now also caring for thousands of beautiful and valuable trees as the result of the application of a little practical common sense in the treatment of one magnolia in the South.

We specialize in the regular annual care of shade and ornamental trees. We do not fill trees with cement or any other nonligneous substance nor practice any expensive fad of doubtful value. Trees on many of America's most beautiful estates have been in our care for years. Several famous country clubs, including Piping Rock, are among our clients. Educational institutions, such as Columbia University in New York City and the University of North Carolina, employ us.

If you have any kind of a tree problem, we would consider it a privilege to advise you. If it is outside our province, we will suggest some wholly reliable person or institution that can help you. If you prefer, we will send a representative—not an uninformed salesman, but a *real tree man*—to inspect your trees and make suggestions as to their care.

We make inspections and handle operations North and South the year round. Right now is an excellent time.

ARMSTRONG TREE SERVICE, LTD.

POUGHKEEPSIE, NEW YORK

David Lincoln Goodwillie, Friend of Conservation

IN THE passing of David Lincoln Goodwillie at Chicago on the morning of December 16, 1924, the cause of forestry and conservation lost a sincere and energetic champion. Mr. Goodwillie had long been a member of The American Forestry Association and at the time of his death had been nominated as a director. Perhaps his greatest contribution to the forestry movement was his service as chairman of the Forestry Committee of the Chamber of Commerce of the United States. In this capacity he presided at many sessions of the committee where foresters, lumbermen, and others were given a chance for the fullest expression of opinion and for the marshaling of facts. The report of this committee was an important contribution to the drafting of the recently enacted Clarke-McNary law, and its work did much to bring together all interested groups. Mr. Goodwillie was president of the Goodwillie-Green Box Company of Chicago, which was enlarged from the former business operating under the name of Goodwillie Brothers. One of his last public acts was an address at the recent Conference on the Utilization of Forest Products, held at Washington, where he pledged the co-operation of the State of Illinois, as a representative of the Illinois Forestry Association. His counsel and inspiration will be missed in The American Forestry Association.

How Birds Saved My Trees

[*Continued from page* 79]

and the peafowl went together. I opened the door of their pen and gave them free range. The Green, or Java, peafowl went to work with avidity on both varieties of caterpillars. The Green peahen, particularly, ate hundreds and hundreds of this devastating pest; the peacock greedily accepted a whole handful of the new but delectable food. The Blue peacock and his hens had always been exceedingly fond of potato bugs and various slugs, and they, too, started in to clean up the hairy caterpillars. All the peafowl would pick the things off the ground; they would grab them from the walls of the different shelters; they would search the tree trunks for the traveling swarm. I have seen the Green peahen jump a yard in the air after those that were on adventure bent, as they swung to and fro on slender threads from the branches of the trees.

The dispositions of the Blue and Green peafowl, by the way, are quite different. The Green are probably the handsomest birds in the world; for the hen, with the exception of the huge ornament, is as beautiful as the cock. But the Green bird has a temper. It will attack people occasionally, not treacherously, but deliberately, with sufficient warning to put one on guard. One's hand or a stick held out is all that is necessary to ward them off. However, these birds are better suited to the Southern States than to the more northern sections of the country.

I had not known at that time that any bird but the yellow- and black-billed cuckoos would eat hairy caterpillars, so I was exceedingly glad to discover that the peafowl devoured them so voraciously, thus protecting my trees in their own way as well as the wild geese were protecting them in their way. Owing to the fact that the cuckoos build their nests close to the ground, in the low bushes, they are not as numerous as they should be. Cats of all kinds are very fond of them and have no difficulty in dragging the mother birds off the nest as well as fledglings and feeding them to their kittens.

Forestry Tour Through Europe

ALL those interested in a forestry tour through the leading European countries are invited to correspond with Prof. A. B. Recknagel, Cornell University, Ithaca, New York. The plans as tentatively made are for a two months' tour in the summer of 1926, starting from Montreal and taking in England, Scotland, Germany, Czechoslovakia, Austria, Switzerland, and France.

The trip would be under expert guidance and would stress the points of greatest interest to Americans in European forestry. Opportunity would be given to meet leading European foresters and to see at first hand the results of their work. The party must be limited to not over forty, and in the interests of economy the trip will be on cabin-passenger boats sailing from Montreal and returning to that port.

Edward A. Bowers

EDWARD AUGUSTUS BOWERS, an honorary member of the Society of American Foresters, passed away on December 8, 1924. Although a lawyer by profession, he was one of the early pioneers in the forestry movement in America, his interest in the subject dating from a period nearly forty years ago, when he was appointed an inspector in the United States Public Land Service, in which position he was concerned with legal matters relating to the public land laws. He served as Assistant Commissioner of the General Land Office from 1893 to 1895 and was Assistant Comptroller of the United States Treasury from 1895 to 1898.

While in the Land Office Mr. Bowers became greatly interested in the forests on the public domain, and was instrumental in the creation of the first forest reserves in the United States. For many years he was a director of the American Forestry Association and twice served as its Secretary. He was appointed a lecturer on forest law in the Yale School of Forestry in 1901 and served in that capacity until ill health caused his retirement in 1917. Few men have had a more keen interest in the wise administration of our public lands and in the furtherance of a conservative forest policy than Mr. Bowers, and in his passing the forestry movement in this country has lost a true and devoted friend.

"It is said that the close fire patrol of the hills by Forest Rangers has caused moonshiners to abandon their former isolated locations and move their 'wildcats' to the comparative safety of the larger towns."—(*News item in Western paper.*)

Do You Know What a Sprag Is?

By S. J. RECORD

ACCORDING to a state report, over three million feet of wood is required annually for making sprags in Pennsylvania. Probably very few people outside the coal-mining region ever heard of a sprag.

A sprag is a piece of wood used to lock the wheels of coal-mining cars, and thus regulate their speed. These cars have no brakes, and when they go too fast the operator throws a round stick between the spokes of one of the wheels, and as this strikes the car sill the wheel is locked. This stick is called a sprag.

Sprags are made of young stems and branches of various kinds of strong hardwoods, such as oak, hickory, maple, dogwood, ash, ironwood, locust, and birch. They are about 21 inches long and pointed at each end.

Formerly they were all made by hand, using only an ax and a knife. One man could make about 200 a day. Finally a machine was devised for turning them out, and with one of these machines two men can turn out several thousand a day.

FORESTERS MEET AT WASHINGTON

An increase in registered attendance of 100 per cent over the next largest annual meeting marked the twenty-fourth yearly gathering of the Society of American Foresters at Washington, D. C., December 30 and 31, 1924.

State and National forestry practice with special reference to the future came in for vigorous discussion, in view of the pending legislation for the extension of the National Forest system throughout the eastern half of the United States.

Through its executive council, the Society decided to indorse no definite legislation.

A new standing committee, with Samuel T. Dana as chairman, was authorized to consider international forestry relations. This was made necessary by the number of international research and educational projects in which the Society has been asked to participate.

Officers for the coming year include Samuel T. Dana, President; Richard T. Fisher, Vice-President; C. G. Smith, Secretary, and C. R. Tillotson, Treasurer.

NEW NATIONAL FORESTS IN THE SOUTH

Establishment of two new National Forests in the South is announced by the Forest Service, bringing the total number of National Forests up to 149.

One of the new forests, known as the Jackson, is located about six miles southeast of Columbia, South Carolina, on the site of Camp Jackson. It embraces about 20,000 acres, and was created by President Coolidge under authority of the Clarke-McNary Forestry Act, which provides, among other things, for National Forests to be established on military reservations, subject to regulations agreed upon by the Secretary of War and the Secretary of Agriculture.

The second new National Forest is known as the McClellan, and consists of about 15,350 acres adjoining the city of Anniston, Alabama, on the site of Camp McClellan. This forest was also created by the President under the provisions of the Clarke-McNary Forestry Act.

Both the Jackson Forest and the McClellan Forest will continue to be used for all necessary military purposes, under plans agreed upon by the Departments of War and Agriculture.

As soon as funds are available, the Forest Service will place these two new National Forests under administration.

PENNSYLVANIA'S FOREST BOND ISSUE

A resolution to authorize an amendment to the State Constitution to permit a bond issue of $25,000,000 for the purchase of forest land was passed by the Pennsylvania Assembly at the 1923 session. It is to be submitted to the 1925 session, which convened in January, and when approved by it will be submitted at the next general election, the fall of 1925, for approval by the voters.

Pennsylvania imports 84 per cent of the timber and more than 70 per cent of the pulpwood used within the state. Lumber consumption has almost doubled in the last 40 years, while lumber production is about one-fourth of what it was 20 years ago. The annual freight bill on imported lumber has reached $25,000,000. This state has the choice of providing forests to meet her wood needs, of being compelled to adjust her timber consumption to a diminishing supply, or of importing at a high price such timber as may be had.

The forest area of the state, excluding farm woodlots and state forests, contains only 3.5 cords of wood per acre. If handled properly, this land can produce an average of one cord per acre *per year*, which means that an acre of forest land will yield 35 cords of wood in 35 years. At this conservative rate of growth, Pennsylvania's forest land will yield each year a total output greater than that of the big lumber cut in 1900, when more than 2,230,000,000 board feet of lumber were cut in Pennsylvania.

FORESTRY CONTESTS FOR TEXAS FARM BOYS

As a part of the Farm Forestry work, a contest among the farm boys of the short-leaf pine region of northeast Texas has been initiated. A first prize of $25, a second prize of $15, and a third prize of one year's subscription to AMERICAN FORESTS AND FOREST LIFE are offered to the boys who secure the best results after practicing forestry on an acre plot of forest land for one year, ending December 31, 1926. Special instructions for the care of the plot are issued by the State Forestry Department. Prizes are offered in six different classes of stands, so that 18 boys will receive prizes. A grand prize of $50 is also offered for the best stand of the whole contest. This makes a total of about $300 offered as prizes. It is hoped that this contest will accomplish three things for forestry, namely:

1. Educate the boys, who will fall heir to the farm woods of northeast Texas, to properly care for and manage these forests.

2. Through the boys, educate the fathers and other farmers as to how the forest should be managed.

3. Establish sample plots of good forestry practice in all parts of the short-leaf pine region, which may serve to influence farmers to institute similar practice on their forest lands.

WASHINGTON SEEKS NEW STATE FORESTRY LAWS

The fourth annual State Forestry Conference, held at Seattle, Washington, recently, devoted the greater part of the time to working out a bill providing for equitable forest taxation.

C. S. Chapman, of Tacoma, was chairman of the committee which drafted the bill, and he was assisted by numerous lumbermen and authorities on taxation and economics. The bill defines "forest land" and 'immature forests" and is based on the yield tax principle.

A particular feature of the bill "establishes a contractual relation between the owner and the state, wherein is established uniformity and gradation of assessment in consonance with forest growth and condition, making a reasonable and equitable relationship between forest payment and income."

INDIANA PURCHASES GAME PRESERVE

The Fish and Game Division of the Indiana Department of Conservation has recently made negotiations for the purchase of a 7,600-acre tract in Brown County, one of the hilly sections of the state, for use as a game preserve.

A large part of this tract is forested and has excellent cover for game. It is planned to reintroduce some wild turkeys and other game birds and animals once native to the region. Hunting will not be allowed.

The Division of Forestry expects to cooperate with the Fish and Game Division to reforest certain portions of the game preserve and bring it into good timber-growing condition.

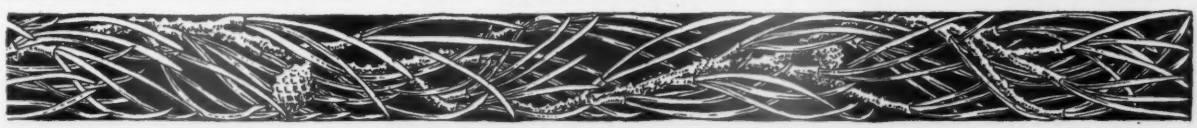
By means of this game preserve the Department of Conservation hopes to keep for all time specimens of the wild life that originally frequented the Indiana hills and at the same time demonstrate the possibility of growing timber-producing trees on land that has been termed "too poor even to grow trees."

PROGRESS MADE IN FOREST LAND PURCHASES

The nineteen units in National Forest land purchases under the Weeks Law are now distributed in eleven different states and total 2,346,354 acres. According to the annual report of the National Forest Reservation Commission, recently transmitted to Congress by Secretary of War Weeks, President of the Commission, the purchases made during the past fiscal year amounted to 130,290 acres, at an average price of $3.26 per acre. The largest purchase, of 61,533 acres, was made in Virginia. Pennsylvania came second, with 46,600 acres, followed by West Virginia, with 14,760 acres, and Alabama, with 3,241 acres.

The Commission has authorized investigation for further purchases in Mississippi, Louisiana, Oklahoma, Missouri, and Kentucky, and investigations have already been made in Texas looking toward the establishment of a National Forest when appropriations are available. Extensive additions to the White Mountain National Forest in New England are considered likely during the coming year.

NURSERIES



WOODLOTS IN ILLINOIS SUPPLY ONLY HALF OF NEEDED FENCE POSTS

Farm woodlots of Illinois have been depleted to the point where they are yielding less than half of the fence posts that are needed annually to replace worn-out ones on farms of the state, according to a forest survey made by the State Natural History Survey. Even when all the posts that are grown in the state are counted, the number produced is only a little more than 52 per cent of all those that are used, according to the survey. Under existing conditions, a shortage of post timber has developed and will increase in severity, the report of the survey points out.

It is estimated that the average Illinois farm, containing 135 acres, requires almost 848 posts in good repair. With 31,974,775 acres of farm land in 237,181 farms, the total number of fence posts in place is 200,163,000. The average period of service of a fence post was found to be about 9¾ years, indicating an annual requirement by farmers in the state for renewals of 20,530,000 posts. This takes no account of the quantity used by other consumers. At present, farm woodlands of the state comprising 2,668,050 acres are producing 10,031,850 fence posts a year, or about half the number that are needed annually for replacements.

There is enough woodland on farms of the state to supply all the present needs of

ENCOURAGEMENT

"I would not be without this splendid monthly, AMERICAN FORESTS AND FOREST LIFE, for each copy is in itself a message to all red-blooded Americans. I hope to become a contributing member very shortly and am at your service for the good of the cause."

J. WILL GATES,
Wittenberg, Wisconsin.

farmers for wood products if the woodlots are properly managed. In the absence of this improved management, however, the shortage of fence posts is being taken care of by importations of white cedar posts from the Lake States, creosoted yellow pine posts from the South, and locust and red cedar posts from Kentucky and Tennessee.

IMPORTANT GOVERNMENT TIMBER SALE ANNOUNCED

The sale of 253,000,000 board feet of government timber on the east side of the Mt. Hood National Forest to the Wasco Pine Box and Lumber Company of The Dalles, Oregon, has just been announced by the Forest Service, by the District Forester of Portland, Oregon. In order to top this area, eight miles of logging road are necessary. The stumpage prices under the contract are $2.00 per thousand board feet for western yellow pine and lodgepole pine, and 50 cents a thousand for fir, larch, and other species. Pine predominates in the tract. The contract runs for eleven years, providing for reappraisal of stumpage rates at the end of each three-year period, in order to take care of anticipated increased values. A large sawmill which will convert the lumber will specialize in the fruit-box trade.

Recreation, grazing, watershed protection, scenic values, and other important features of forest administration will continue without interference by this operation, which emphasizes the fact that the primary purpose of National Forests is to grow timber continuously.

SOUTHERN CALIFORNIA BOARD OF FIRE REVIEW REPORTS

The special Board of Fire Review appointed by Col. W. B. Greeley, Chief of the United States Forest Service, to determine the efficiency of the fire-prevention methods in force on the Angeles National Forest and to formulate a stronger constructive policy for the future protection of the forests and watersheds of southern California from the ravages of fire, held sessions in Los Angeles, Pasadena, San Bernardino, and other foothill points during November and December, 1924.

The testimony was largely by Government and Los Angeles County forestry officials, who refought before the board the fierce and gruelling battle waged against the flames of the disastrous San Gabriel fire, which last September swept over 50,000 acres of valuable brush and timberlands in the San Gabriel watersheds of the Angeles National Forest and which it cost over $300,000 to suppress.

Among other findings and recommendations of the board is the suggested amendment of the Clarke-McNary law, so that fire co-operation and land acquisition may be extended to lands on watersheds from which water is obtained for domestic or irrigation purposes.

PER CAPITA LUMBER CONSUMPTION IN ILLINOIS EXCEEDS FIGURE FOR ENTIRE COUNTRY

Although Illinois is known as a prairie state, the per capita use of sawed lumber in this state is about 15 per cent higher than the average for the country as a whole, according to a forest survey report of the State Natural History Survey. The last available figures show that the annual consumption of lumber in the state was 2,353,662,000 board feet, or an average of 363 board feet for each person in the state. In contrast to this, the per capita consumption for the country as a whole during the same year was 316 board feet.

However, the total consumption of wood in the state includes not only sawed lumber, but also cordwood, cross-ties, fence posts, poles, piling, cooperage, shingles, lath, logs for veneer, charcoal, pulp, excelsior, and other wood products, the report points out. For all these uses the state consumes a total of 560,719,983 cubic feet of lumber, or more than 86 cubic feet a person.

One acre of land for every person in the state, or 6,445,057 acres, devoted to intensive forestry, would be needed to supply this quantity of wood perpetually, according to the report. Twice this area would hardly be enough to yield this quantity under the present neglectful, wasteful, and injurious practices under which woodlands of the state are handled, the report adds.

Almost 70 per cent of all the wood which is used in the state, or 392,277,000 cubic feet, goes into sawed lumber, while all other uses, including cordwood, ties, mine timbers, posts, cooperage, veneers, shingles, piles, and poles, require 168,422,988 cubic feet, or a little more than 30 per cent of all the wood which is used.

In the Chicago district alone, comprising Cook and Dupage counties, an average of 1,466,820,000 board feet of lumber was consumed annually during the decade from 1910 to 1920, according to the report. This gave a per capita consumption in that district of almost 474 board feet. The per capita consumption of sawed lumber for the remainder of the state is 258 board feet, while the per capita consumption of lumber on farms is approximately 272 board feet.

VIRGINIA NURSERY GETS TOO MUCH WATER

In spite of a disastrous spring season, the Virginia State Forest Nursery had stock for distribution. The nursery, located on low ground, was completely inundated once and partially overflowed four other times. Much of the seed and stock that was not washed away was buried under from one to four inches of silt.

The three native pines—loblolly for the coastal plain, short-leaf for the Piedmont section, and white pine for the mountains—are considered safest and best. Scotch pine and black locust are raised for planting on

Copies of the 1924 Index of AMERICAN FORESTS AND FOREST LIFE will be sent to members upon request.

very poor, dry, or eroded areas, and some tulip poplar and Norway spruce for more favorable sites. Several other species, including *Pinus radiata*, seed of which was supplied by the New Zealand Department of Forestry, are being tried out on a small scale. Where walnut, oak, or other taproot species are desired, direct seeding is usually recommended.

BOOK REVIEWS

SKIING FOR BEGINNERS. By Arnold Lunn. E. P. Dutton and Company, publishers, New York. Price, $2.00 net.

An analysis by Mr. Arnold Lunn of the many problems confronting the beginner. In the initial chapter on equipment the well-known expert instructs fully on the various points of adequate and economical equipment, and in subsequent chapters he explains how and when to use it. Mr. Lunn touches upon the need for study of snow craft, in the mastery of the technic of ski running. He outlines the theory of turns and jumps, illustrating their use. The book is a most complete summary of the facts essential for the ski mountaineer, and while written for beginners contains much that is of permanent value to the expert.

SHRUBS OF INDIANA. By Charles C. Deam, Indiana State Forester. Published by Indiana State Department of Conservation. Publication No. 44.

This volume forms the latest addition to a rapidly growing list of monographs covering the natural resources of Indiana. It is an authentic and comprehensive tabulation of native shrubs and is a link in the chain of a complete natural history survey undertaken by the Conservation Commission. Based on their economic value, the shrubs are put into four divisions—those used for ornamental planting, those used in medicine and the industries, those bearing fruits used as food, those furnishing refuge and shelter for birds. One hundred and forty-three native species are recognized by the author and an adequate botanical description given of each species found within the area. The general distribution of each species is first given and is followed by the distribution in Indiana. Maps indicate areas referred to. The illustrations are photographic reproductions of specimens in the author's herbarium. The book should be of interest to the plant breeder and horticulturist, as well as to nurserymen, scouts, students of botany, etc.

A MASSIVE OAK IN ILLINOIS

By R. B. MILLER

This picture of a big bur-oak tree in Union County, Illinois, may be of interest to those who never connected big trees with that State. Such specimens are occasionally found in some of the bottom lands of southern Illinois, which are being rapidly cleared for farming purposes, or in some of the few remaining bottom-land forests of the Wabash Valley.

The one pictured was "discovered" in 1920, when cutting operations were just starting on the Spann tract, between Jonesboro and Ware, Illinois, and quite near the latter village.

YES, THEY DO COME BIG IN ILLINOIS

The picture was taken in the summer of 1922 by Prof. H. H. Chapman, who was then working on the economic survey for Illinois, the results of which have just been published. However, it was not possible to make measurements on the felled tree until the summer of 1924, which were as follows:

Total height	121 feet.
Height of stump	3 feet.
Log length	55 feet.
Circumference at breast height	15 feet.
Crown spread	63 feet.
Diameter inside bark on stump	50 inches.
Diameter of top	35 inches.
Age	220 years.
Board-foot content	5,000 feet.

The growth of other hardwoods on the Spann tract was exceedingly heavy, and the sycamores, soft maples, pin oaks, and hackberries were very large. Some were sold as furniture logs, others for veneers, and the remaining trees were put into railroad ties.

ERIE RAILROAD OPERATES FORESTRY DEMONSTRATION TRAIN

Cars containing exhibits on reforestation, showing different kinds of trees, how to plant, how to tell the age, and other facts relating to forestry, have been equipped by the Forest Service, the New York State Conservation Commission, the New York State College of Forestry at Syracuse, and the Pennsylvania Department of Forests and Waters, and have stopped at 50 towns located on the Erie Railroad in New York, New Jersey, and Pennsylvania.

There has been no charge for admission, and visitors to the exhibits have included farmers, business men, rod and gun clubs, boy scouts, biology students from high schools, and many different local associations.

Luther D. Fuller, chief agricultural agent of the Erie Railroad, points out that there are thousands of acres of idle land in these three states which are not now earning taxes and which are suitable for timber-growing.

NEW YORK DISTRIBUTES ALMOST 10,000,000

Up to the close of the fall planting season of 1924, the Conservation Commission distributed from its three nurseries 9,247,090 young trees for reforesting purposes. This is the largest sale of trees in the history of the Commission and would have been larger by upward of 800,000 trees had not the protracted spell of extremely dry weather shortened the fall planting season. Because of the extreme dryness, the Commission declined to fill many orders and recommended to applicants for trees that they defer planting until next spring.

Herkimer Post of the American Legion, which began the planting of a memorial forest in 1922 with a plantation of 50,000 trees, recently completed a survey of the tract and found that only 600 trees, or a trifle over 1 per cent, had been lost.

The village of Warsaw, which began the reforestation of a bare watershed for the better protection of its water supply, has already planted 35,000 trees and has placed an order for 25,000 more to be planted next spring.

FIRES DAMAGE MARYLAND CITY'S WATER SUPPLY

The effect of the fires that occurred last fall on the watershed from which the city of Frederick, Maryland, gets it water are now being felt. When the first heavy rains fell after the extended drought, the ash, which lay so thick all over the burned area, was washed down into the streams and from there got into the water mains. The result was that a number of the meters in Frederick were put out of commission and the water was very cloudy. After one of the recent heavy rains the water was muddy. It will pay the city of Frederick to help protect its watershed.

ATTENTION, FORESTERS!

AMERICAN FORESTS AND FOREST LIFE will print, free of charge in this column, advertisements of foresters wanting positions, or of persons having employment to offer foresters.

POSITIONS WANTED

GRADUATE FORESTER, with 6 years' experience in teaching forestry and 10 years' practical experience in surveying, estimating, appraising and managing timberlands, wants position as forest engineer with a lumber or wood-using company, or as manager of large forest estate. Address Box 2, care AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (11-12-1)

GRADUATE FORESTER of the University of Michigan, with 10 years' experience in the Lake States, Montana, Idaho, and Oregon, wishes forestry work with corporation, city, or private individual. Especially well qualified for topographic surveys, timber estimates, reforestation, and fire protection. Address Box 3, care AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (11-12-1)

GRADUATE FORESTER, with woods and mill experience in the East and Pacific Northwest, at present employed as industrial executive, wants work that will take him back into forestry and the out-of-doors. A married man, sober and industrious, can furnish excellent references. Address Box 6, care AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (2-3-4)

TEACHER—Available September, 1925, B. Sc. F., desires position teacher Biology, General Science. Nature Subjects, High or Preparatory School where both theory and first-hand practical instruction is desired. Address Box 7, care AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (2-3-4)

TREE SURGEON—Position wanted by young man thoroughly trained in all branches of tree surgery, including pruning, cavity work, bracing, cabeling, planting, and fertilization. Good education, best references. Year around work desired either with corporation or individual. Address Box 8, care AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (2-3-4)

HELP WANTED

FORESTERS in every locality who can devote at least six hours a week representing a national association and securing memberships. Address Box 4, care of AMERICAN FORESTS AND FOREST LIFE, Washington, D. C.

GRADUATE FORESTER, who wishes connection with progressive corporation specializing in tree surgery work. Applicant must have ability to sell and manage surgery and planting. No capital needed and only those willing to prove their worth need apply. Splendid opportunity to assist in expanding a sound business and becoming financially interested through successful effort. Address Box 5, care AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (12-1-2)

CONNECTICUT HAS EIGHT STATE FORESTS

State Forests in Connecticut now total 10,448 acres, distributed in eight units, of which the Natchaug, with 2,408 acres, is the largest. Acreages of the other units are: Meshomasic, 2,177; Union, 560; Simsbury, 130; Housatonic, 1,806; Mohawk, 1,374; Tunxis, 1,258; People's, 735.

WEST VIRGINIA ORGANIZES FORESTRY ASSOCIATION

At a recent meeting of foresters held at Elkins there was organized the West Virginia Forestry Association. A talk by John Foley, Forester of the Pennsylvania Railroad Company, on the tree planting operations initiated by his Company over fifteen years was an interesting feature. Papers followed by discussion were given on fire protection, taxation of West Virginia timberlands, cost of growing timber for saw logs and pulp, effect of grazing on young growth timber, modern methods of timber cruising and progress in securing a National Park in West Virginia. Officers elected were: President, W. L. Gooch, Swandale; Vice President, B. L. Roberts, Richwood; and Secretary, P. M. Browning, Buchannon.

NEW KRAFT PAPER MILL OPENED AT BOGULUSA

A copy of the *Bogulusa Enterprise*, printed entirely on paper made in the new mill of the Bogulusa Paper Company, was recently received by AMERICAN FORESTS AND FOREST LIFE.

The company now produces 125 tons of container liner, 80 tons of pulp, and 55 tons of Kraft wrapping paper in twenty-four hours.

CANADA MAKES REFORESTATION PROGRESS

Forest nurseries of the Province of Ontario have expanded until they have a capacity of several million transplants annually, with the result that several municipalities and countless individual farmers have become interested in replanting their areas. A co-operative arrangement between the municipality and the province provides that the province will undertake the planting and management where the municipality purchases the land, and about twenty-five municipalities have taken advantage of this.

Quebec has its government forest nursery, with a capacity of about five million trees, distributing to private owners of forest lands, educational bodies, towns, etc., which is carrying on a very valuable work. During the year the sum of $25,000 was set aside by the Provincial Government for the establishment of a bureau of forest research to study the greater growth of trees by natural and artificial methods.

New Brunswick has but recently made a start on the work of reforestation, but is progressing rapidly. Activities for the past couple of years have centered about the provincial university, where a parcel of land was set apart for the purpose and seed beds set out. This fall forest reseeding experiments were commenced on one hundred acres of burned timber lands burned over during the summer. These operations are under the direction of the Federal Forest Service, which has been conducting similar work elsewhere in the province.

As an up-to-date example of what is being done by the large pulp and paper concerns of the Dominion, the season's work of the Abitibi Company, which commenced replanting operations a year ago, may be recorded. This year the company has set out 123,500 trees of three and four years old, grown in its nurseries. The species planted were white spruce, 20,000 four years old; Norway spruce, 55,000 four years old; jack pine, 31,900 three years old; and Scotch pine, 16,600 three years old.

CALIFORNIA PROPOSES PAID CAMP-FIRE PERMIT LAW

Believing that if campers are responsible for a large number of our forest fires, they should pay their share for preventing and controlling them, the California State Board of Forestry law is urging the legislature to pass a law requiring campers to secure camp-fire permits somewhat on the order of hunting licenses. The proposed law, which is the first of its kind ever suggested, will add a considerable revenue to the fund for protection of California's forests. It is planned that the charge for each permit will be one dollar.

Another measure which will be urged upon the legislature is the appropriation of

$150,000 for the purchase of cut-over and brush-covered watershed lands for State Forestry purposes. A second attempt will also be made to secure adoption of the constitutional amendment for placing young forest trees under the same tax-exempt provision now covering nut trees, fruit trees, and vines.

ALMOST TWO MILLION PEOPLE VISIT NATIONAL PARKS

Over one million six hundred thousand people visited national parks and monuments during the 1924 season, according to the Department of the Interior. That these national reservations are steadily growing in popularity as places of outdoor recreation was proven by the fact that over 160,000 more people visited them this year than last, in spite of the hoof-and-mouth disease in California, which caused a decided dropping off in travel to two of the California parks, and the reports of numerous forest fires, which deterred many visitors from going to the parks, although these areas themselves were unusually free from fires, due to the vigilance of park rangers and the care taken by park visitors to guard against the fire hazard.

Rocky Mountain National Park, in Colorado, with a visiting list of 224,211 people, heads the list, as it did last year. Hot Springs comes next, with 164,175 visitors, and Mount Rainier is a close third, with 161,473. Four others of the parks—Yellowstone, Yosemite, Grand Canyon, and Platt—each were seen by over a hundred thousand visitors, and six of the parks showed a travel increase of 25 per cent or more.

IMPORTANT CONSERVATION MEETINGS HELD IN CALIFORNIA

That there is an awakened interest in western states for better handling of forest, oil, water, and agricultural resources was made quite evident at two meetings, at each of which conservation of natural resources occupied a large part of the program.

On November 19, 1924, the California Development Association unveiled a mammoth relief map of the state, which is permanently installed in the Ferry Building, San Francisco. The Development Association is really the state chamber of commerce, and delegates from every county in the state were present for the ceremony. Taking advantage of the opportunity in having present so many business men from all sections of California, Mr. Norman H. Sloane, formerly a forest supervisor, now the very capable general manager of the California Development Association, carried through a very successful afternoon's program on conservation. Wood, water recreation, oil, minerals, and grazing lands were discussed. There was strong evidence of a rapidly developing public sentiment which may in the near future insist on permanent forest management throughout California's forests.

The second meeting was held in Los Angeles, December 2 and 3, 1924, and was a Pacific-Coast-wide meeting rather than a state meeting. It marked an important forward step in forestry on the Pacific slope. The western division of the Chamber of Commerce of the United States was in session, with several hundred delegates present from the eleven western states, Hawaii, and the Philippines. The two-day session was devoted to a detailed discussion of four topics: extravagance in industry and in government; the business of farming; reforestation and shipping. The forestry portion of the program included fourteen addresses from business men, lumbermen, and foresters, emphasizing sharply the importance of doing something big and definite at once. It is hoped that action may result, perhaps through the United States Chamber of Commerce as a whole.

The long fight is bringing results. It is quite certain that the western states, on the threshold of a great future, are going ahead with something of a definite plan and are not going to make the same mistakes of their eastern sister states.

HOLY LAND WILL HAVE ITS OWN FORESTS

According to recent reports from Consul Oscar S. Heizer, splendid progress has been made in Palestine in replacing trees which were removed for railway and domestic fuel during the war. Nearly 3,000,000 trees were planted between 1920 and 1924. Government nurseries have supplied the stock, and commendable work has been done by the Palestine Zionist executive and the Supreme Moslem Council. Villagers, municipalities, hospitals, and owners of private estates have carried on planting operations and the local forest service has planted more than a million timber, ornamental, and shade trees. The species are principally olive, eucalyptus, and fruit trees of various kinds.

Copies of the 1924 Index of AMERICAN FORESTS AND FOREST LIFE will be sent to members upon request.

Rejuvenate Your Trees: *The Healcollar*

When the Bartlett Associates use the Healcollar in filling cavities in your shade trees, you are certain of lasting satisfaction. Healthy growth and bark cover the edges so quickly that new infection is impossible.

Ninety per cent of old style concrete cavity fillings are faulty or worse, according to government authorities. This is because the usual filler causes the tree to die along the edges; or the filler becomes a rigid mass that soon works loose. Moisture and reinfection almost always enter the crevices.

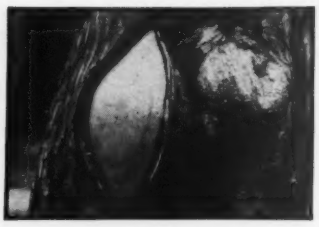
But the Healcollar, the most radical advance of modern tree surgery, hermetically seals the joints. It actually hastens the vital *early* growth. It forms a bond between filler and tree.

Installed in a thousand trees since spring, the Healcollar has made cavity filling successful. It has added decades of life to those trees, as it will to yours. Best of all, it surely restores the beauty and health that comes from sturdy strength.

Ask the Bartlett Associates today about the Healcollar, and where in your neighborhood you can see it.

Now It Can Be Done

When the cavity has just been filled is the crucial time when the success of the operation is determined. The Healcollar absolutely prevents intrusion by more plant and insect parasites. Now



is the *first* time when tree owners can actually get this protection.

NUWUD, THE FLEXIBLE FILLER, is also used exclusively by this company. Permanent and yet flexible, perfectly adapted to the living tree of which it becomes a part, NuwuD has in thousands of cases avoided the evil results inseparable from the use of cement, especially in large cavities. It forms a perfect union with the Healcollar.

THE SCIENTIFIC TREE SURGEONS: The Bartlett Company, under the leadership of the Bartlett Associates, is the unique organization in its important field. Its reputation is based on decades of research and experience. NuwuD and the Healcollar are but the latest of its many contributions to modern tree surgery.

TREE CONSULTATION
DIAGNOSING
FERTILIZING
SPRAYING
BRACING
TREE SURGERY
LIGHTNING PROTECTION
IMPROVEMENT CUTTING
PRUNING

The Bartlett Way

The Bartlett Guarantee

Bartlett work is guaranteed. Any defective workmanship or mechanical fault will be made good at any time.

THE BARTLETT ASSOCIATES

The F. A. Bartlett Tree Expert Company

STAMFORD, CONNECTICUT

444 Tremont Building, Boston, Mass. 709 Harrison Building, Philadelphia, Pa.
Portland, Me. Wenham, Mass. Danbury, Conn. Mount Vernon and New Rochelle, N. Y.
Westbury, L. I. Morristown, N. J. Newburgh, N. Y. Lansdowne, Pa.

Press of Judd & Detweiler, Inc., Washington, D. C.